20T080 "EZ3/000T

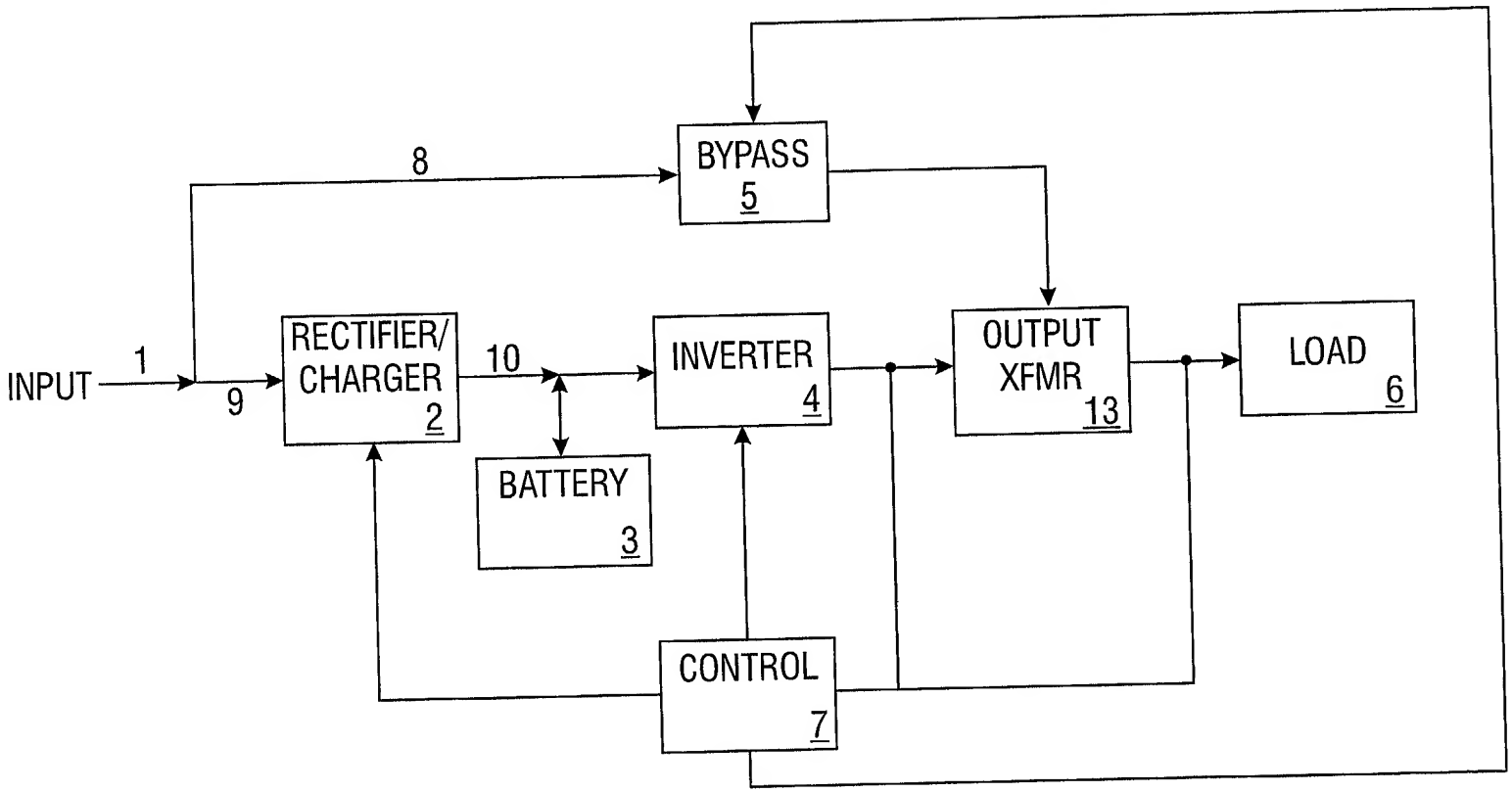



FIG. 1

PATENT & TRADEMARK OFFICE
AUG 01 2002
OIPE
JC109

20T080 "E2Z00T

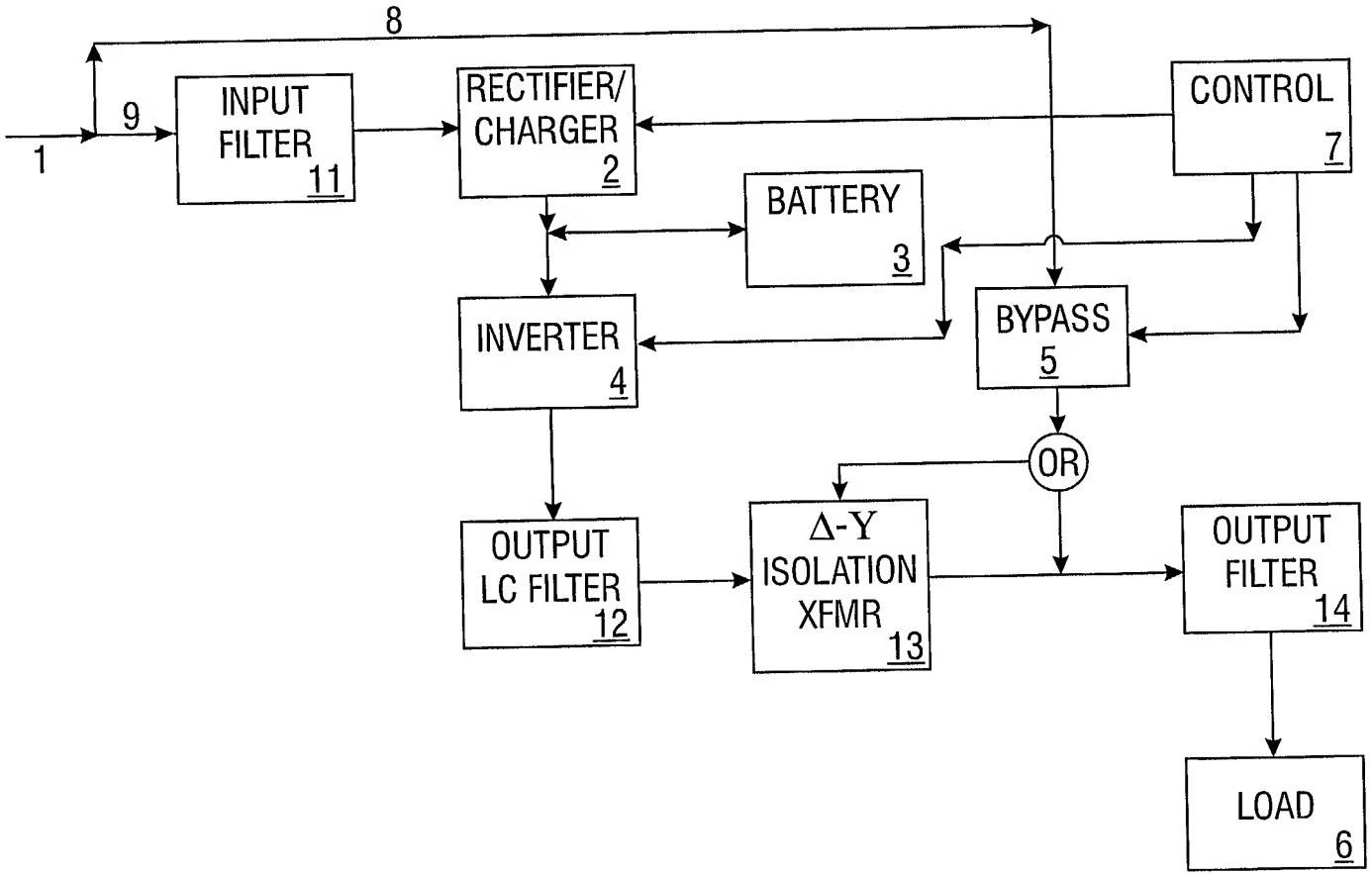



FIG. 2

PATENT & TRADEMARK OFFICE
AUG 0 1 2002
OIPE
JC109

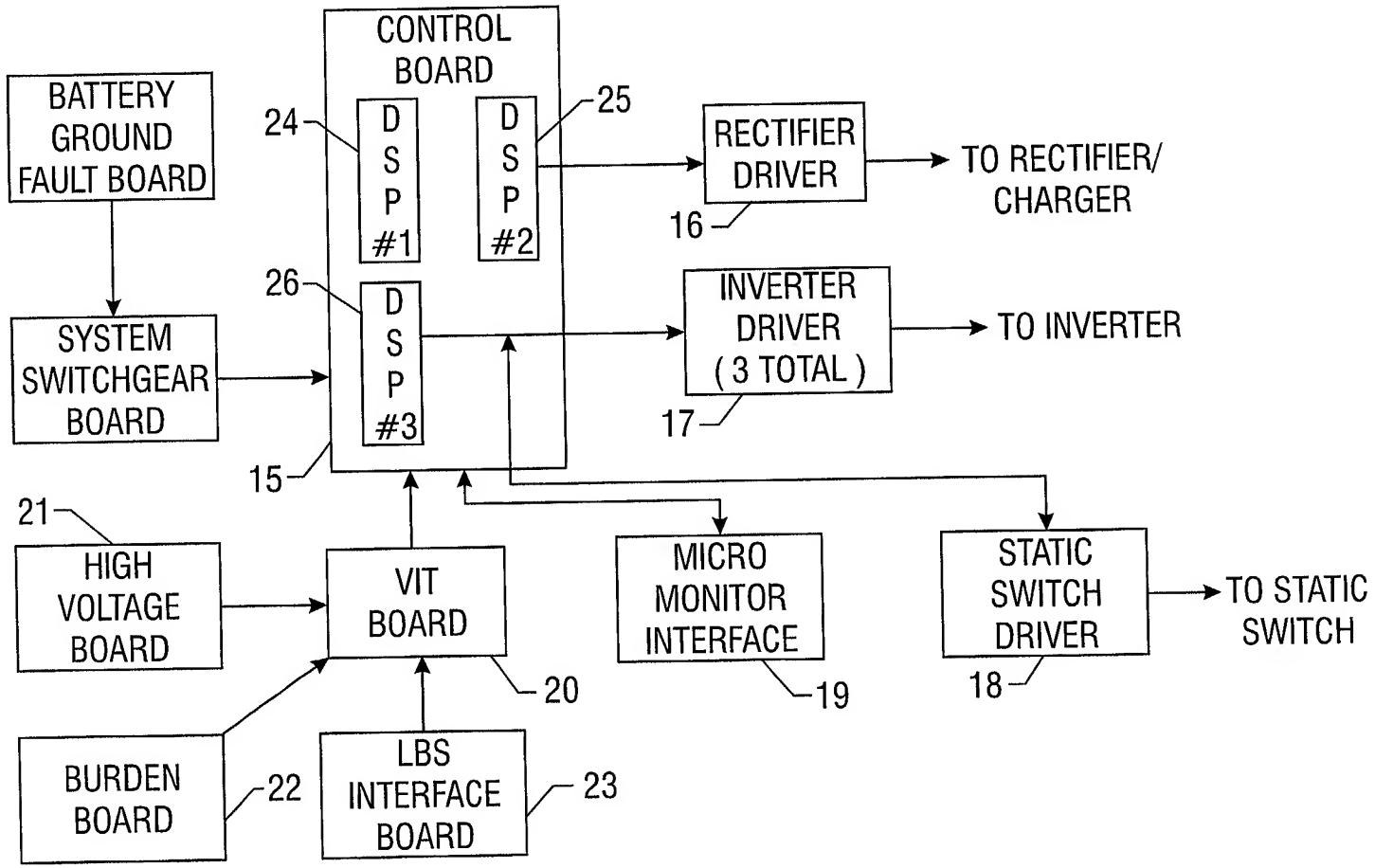



FIG. 3

PATENT & TRADEMARK OFFICE OIPE AUG 01 2002 JC109

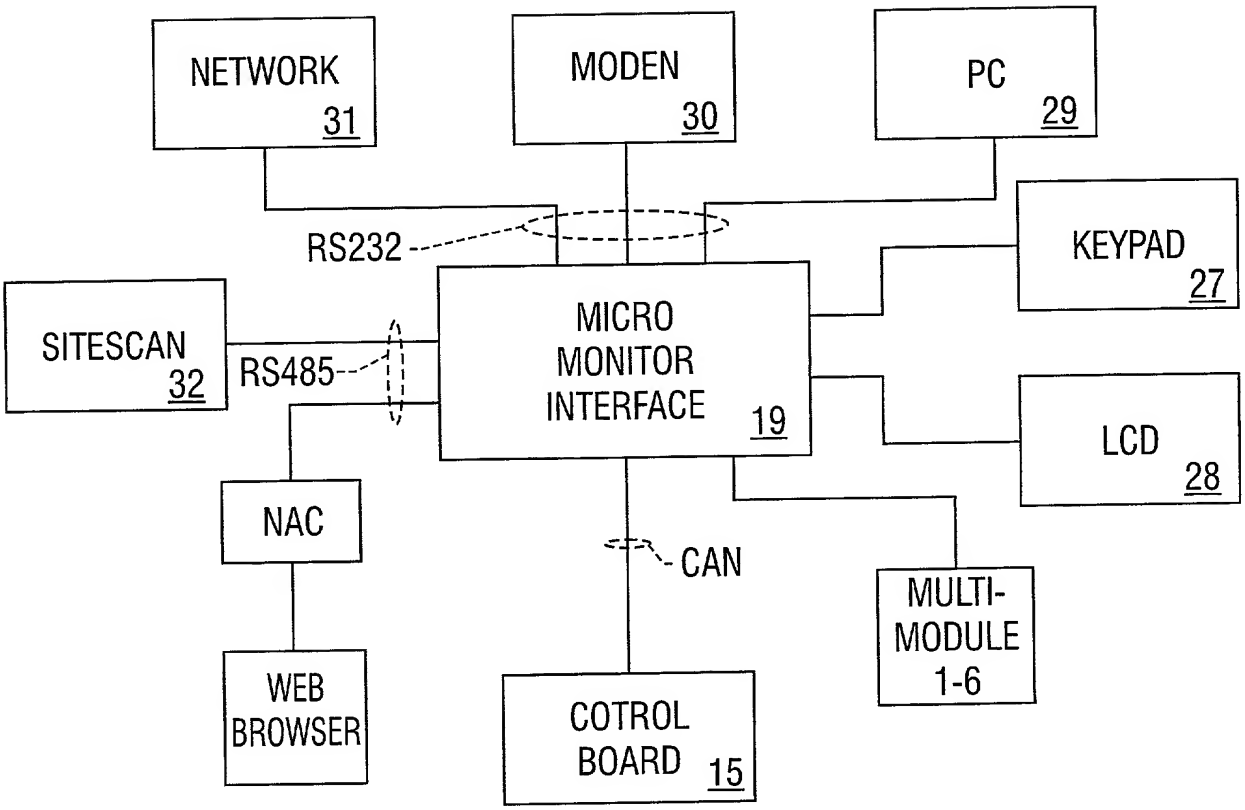



FIG. 4

OIPE JC109
AUG 01 2002
PATENT & TRADEMARK OFFICE

20170880 - 07/29/2002

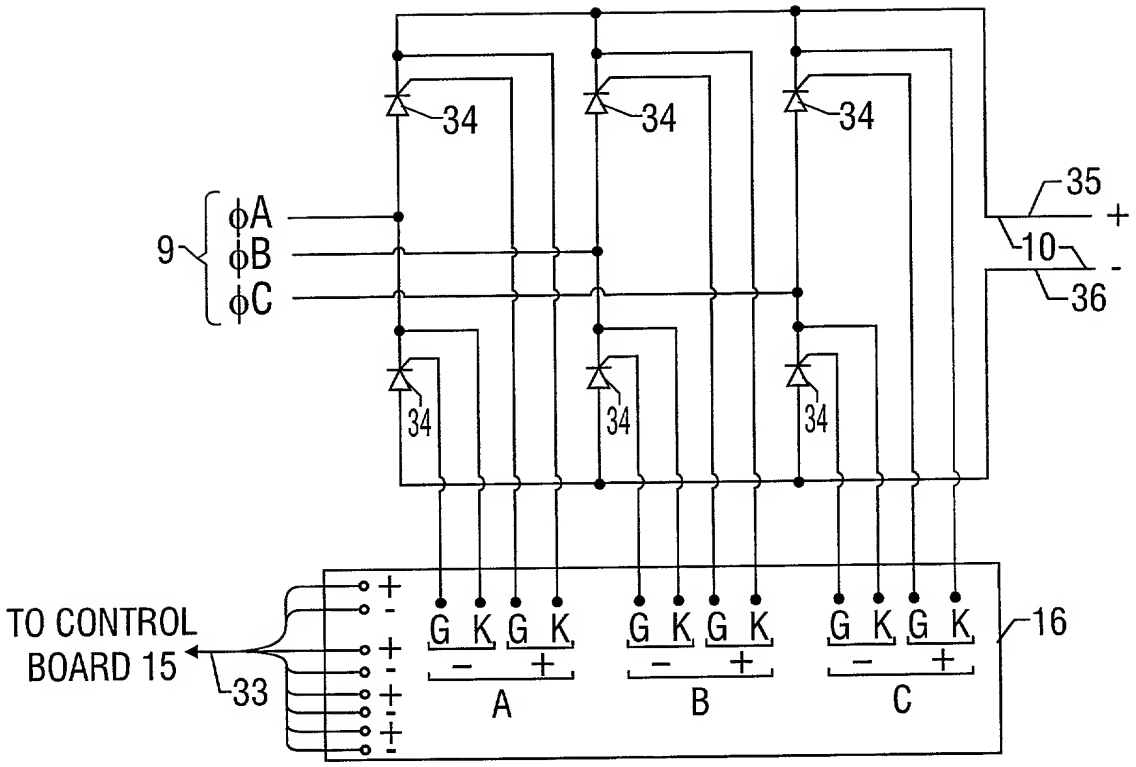



FIG. 5

OIPE
JC109
AUG 0 1 2002
PATENT & TRADEMARK OFFICE

20C080 "EZ2800T

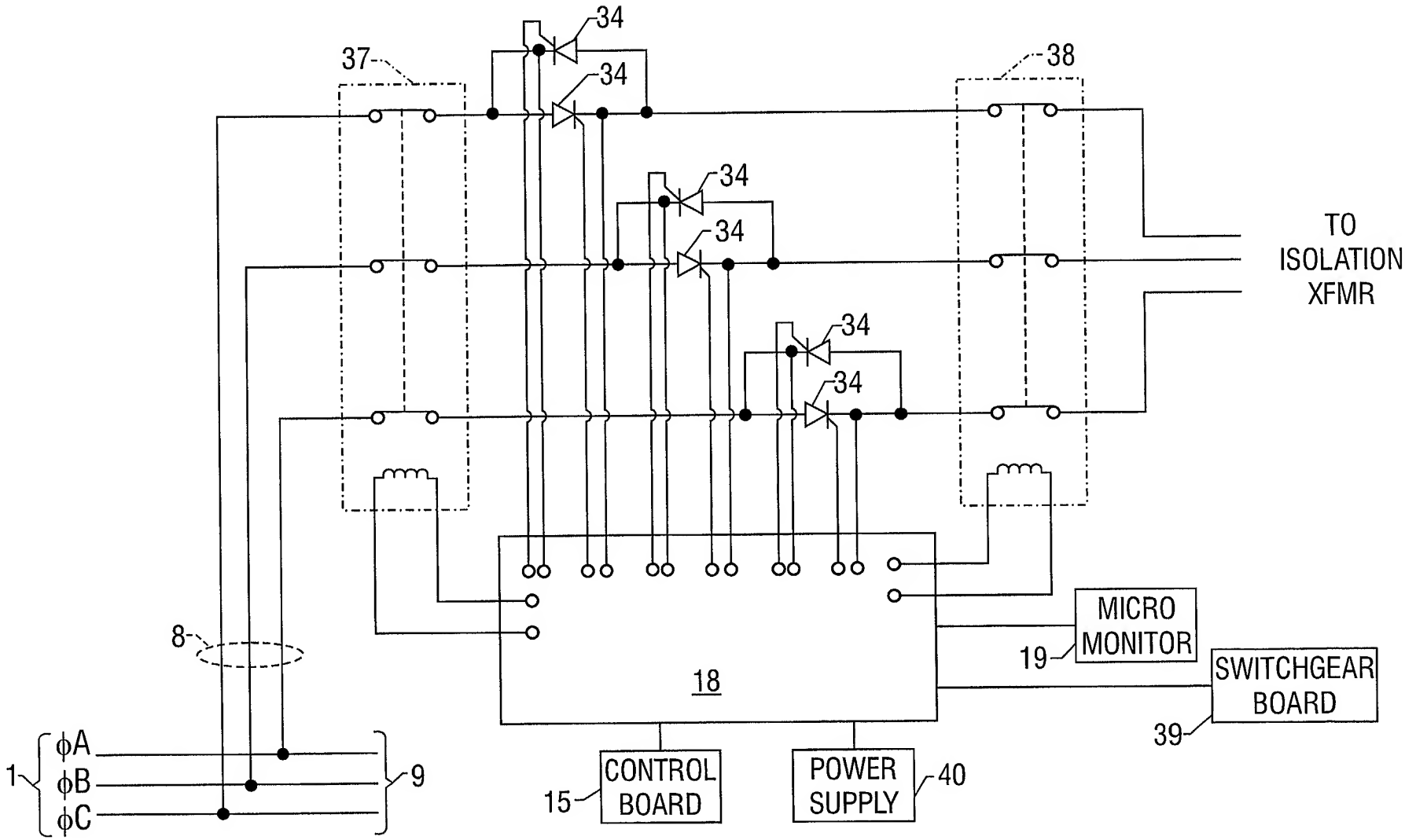



FIG. 6

PATENT & TRADEMARK OFFICE
AUG 01 2002
OIPE
JC109

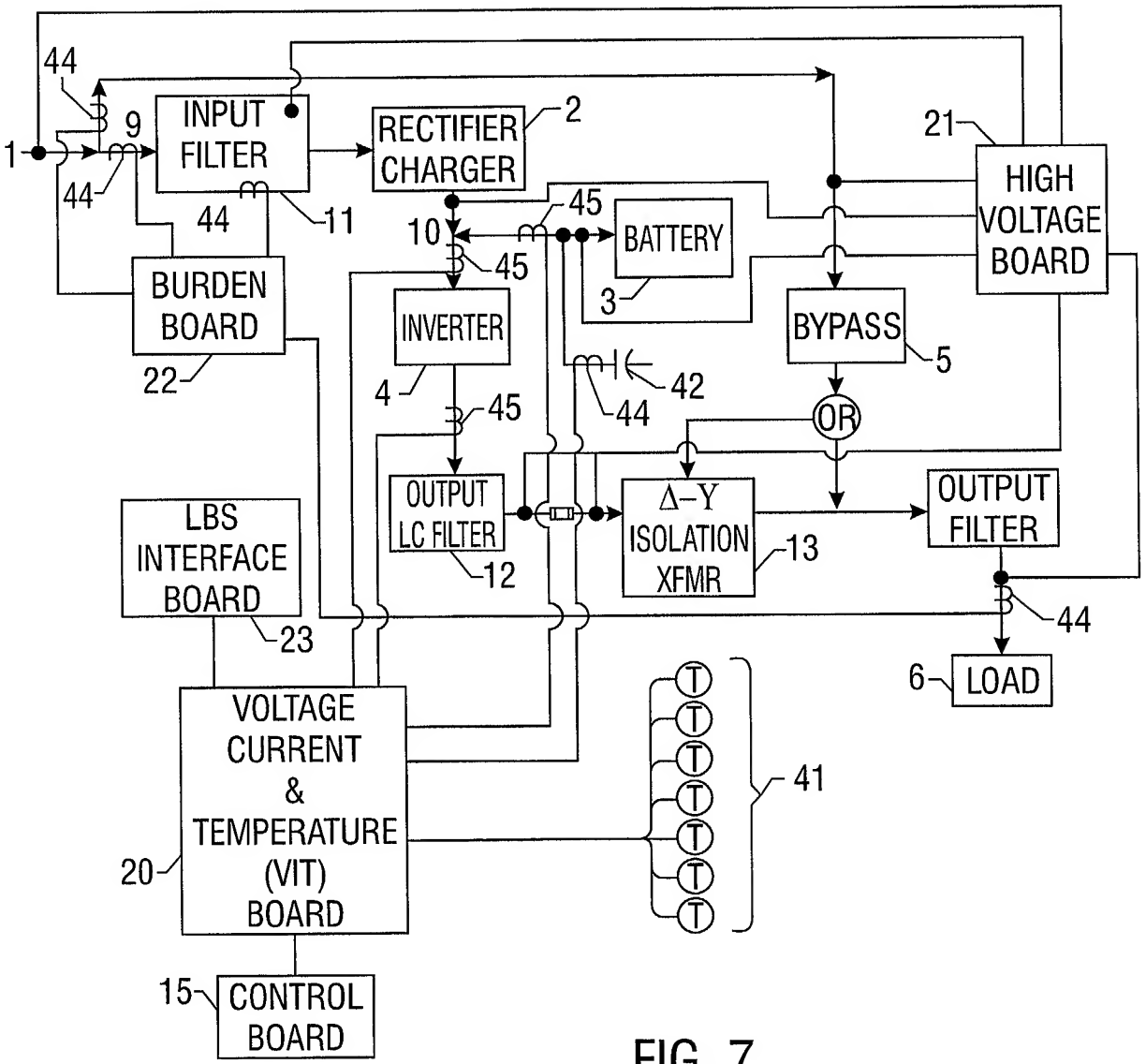



FIG. 7

PATENT & TRADEMARK OFFICE OIPE AUG 01 2002 JC109

20F080 "52700P

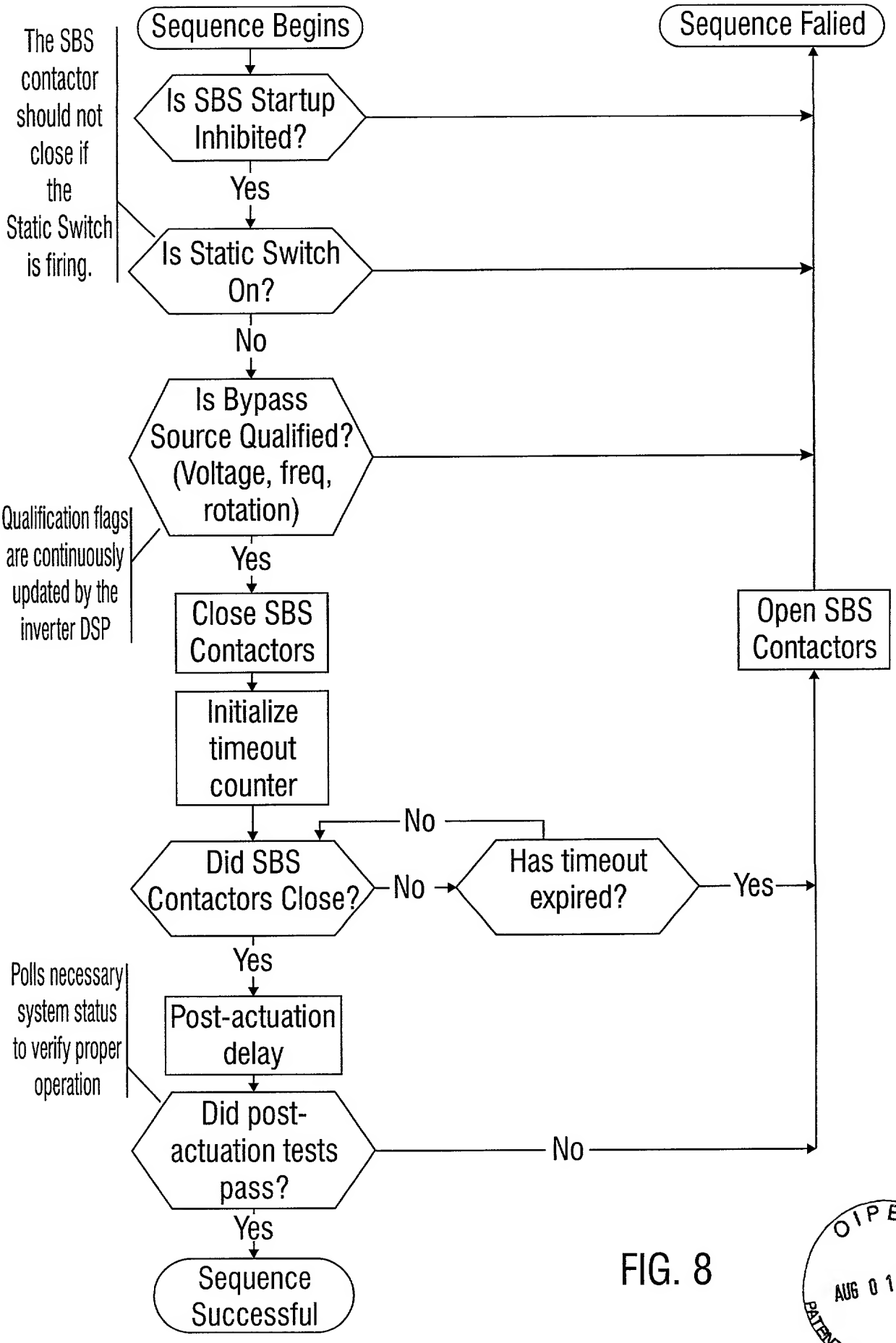
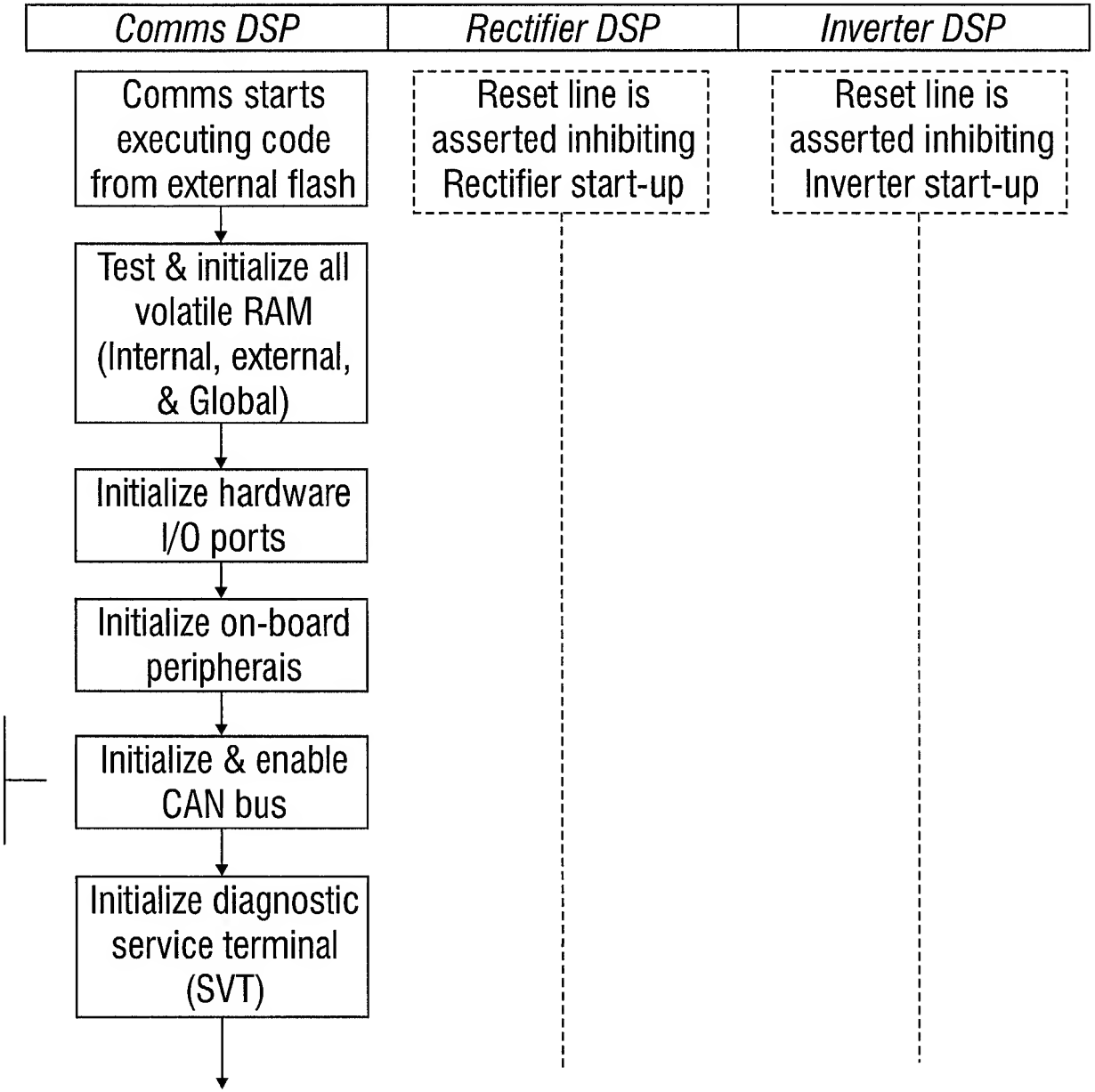



FIG. 8

OIPE JC109
AUG 0 1 2002
PATENT & TRADEMARK OFFICE




PATENT & TRADEMARK OFFICE 1600
AUG 01 2002
OIPE

FIG. 8A-1

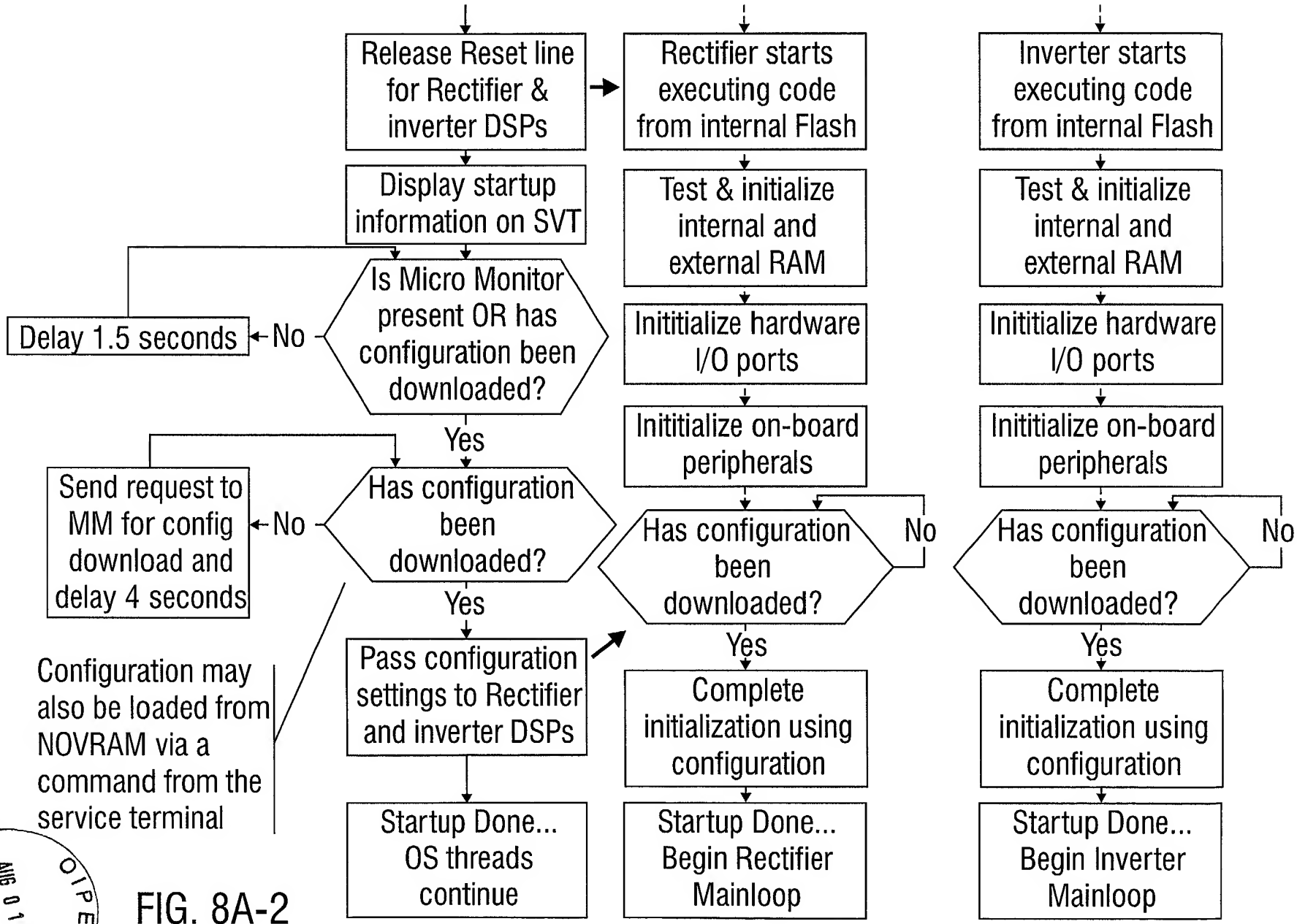



FIG. 8A-2

PATENT & TRADEMARK OFFICE
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OIPE
JC109

20F050-E2V0001

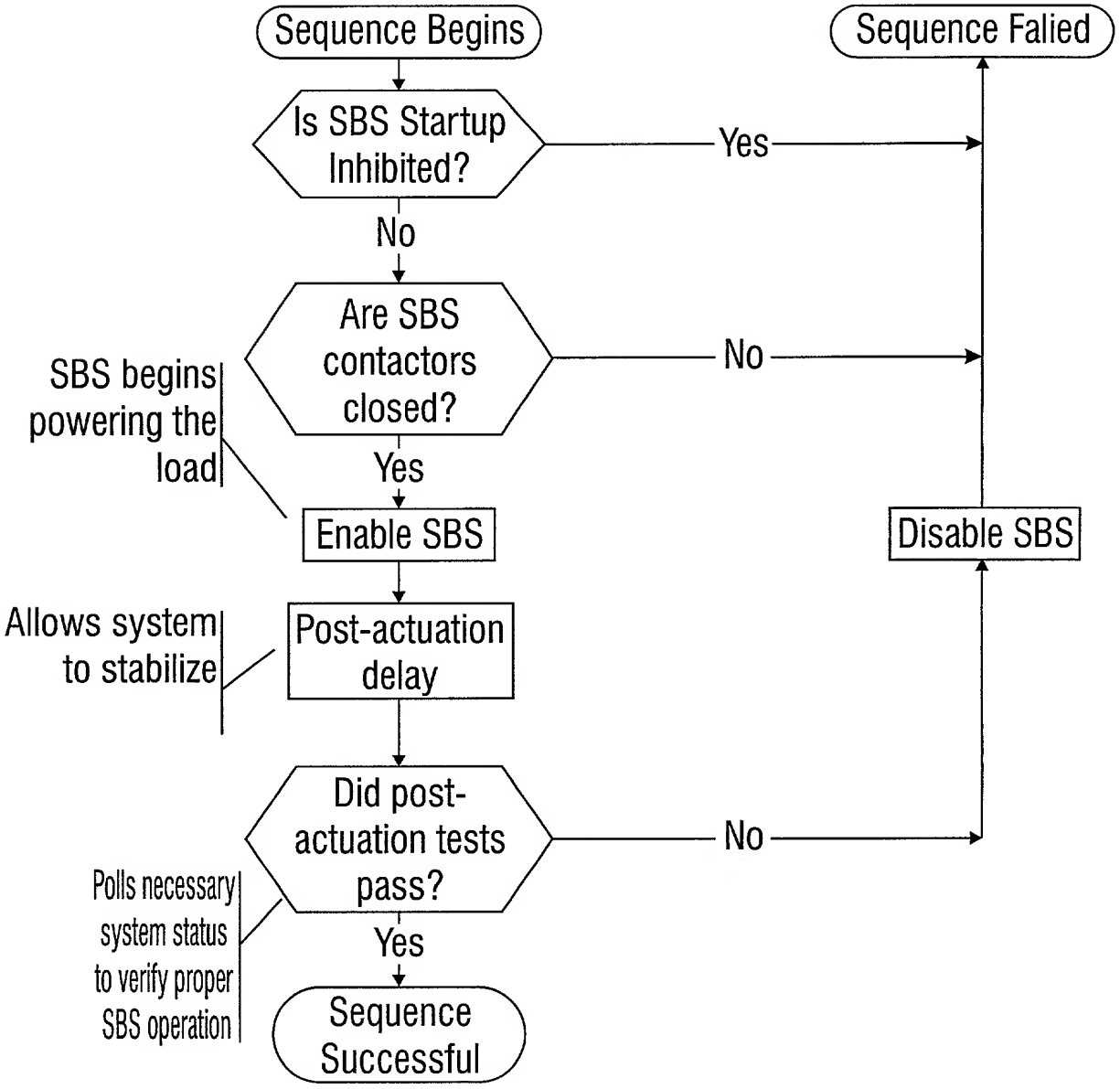



FIG. 9

OIPE JC109
AUG 01 2002
PATENT & TRADEMARK OFFICE

20170801 5/23/2003

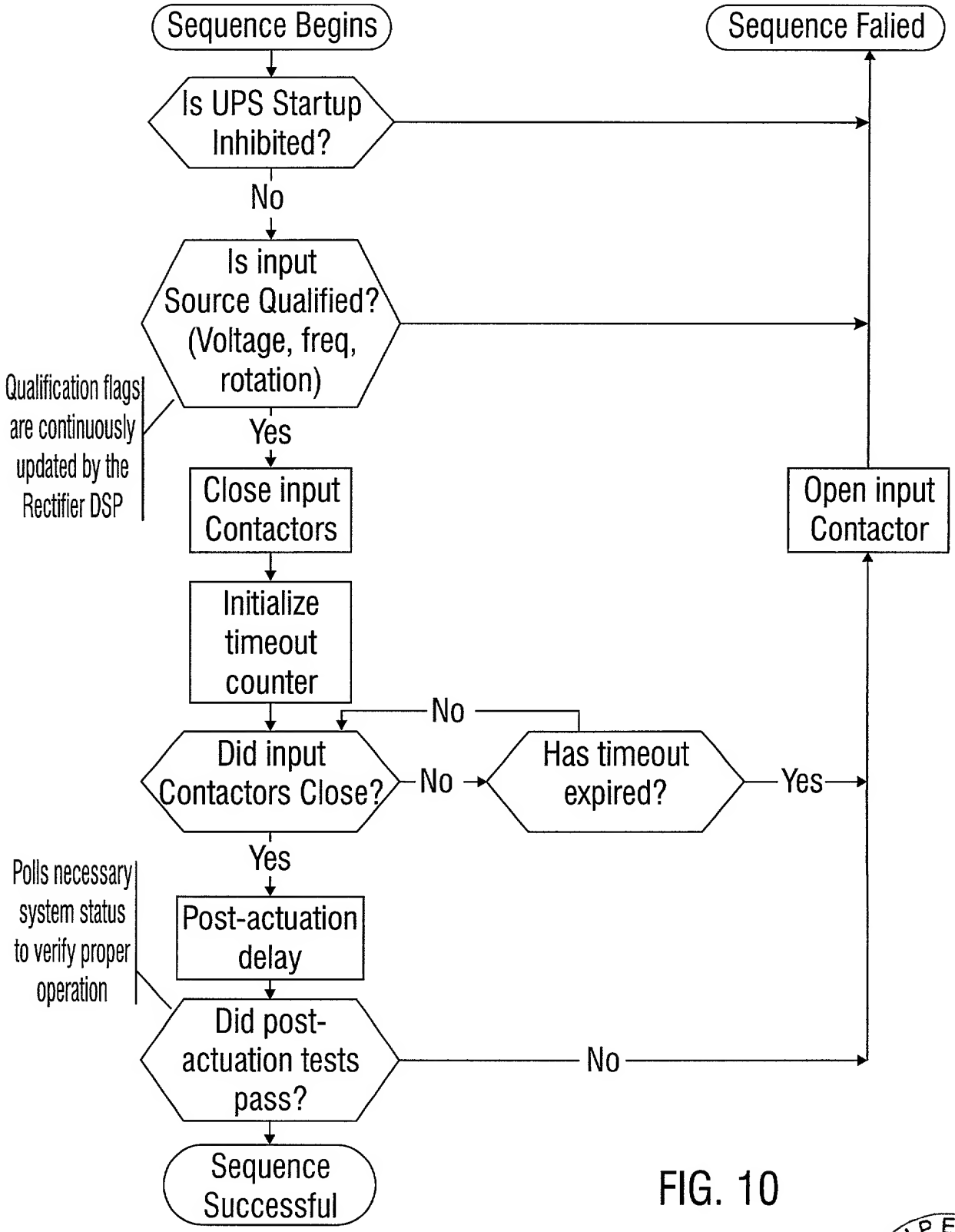



FIG. 10

OIPE JC109
AUG 0 1 2002
PATENT & TRADEMARK OFFICE

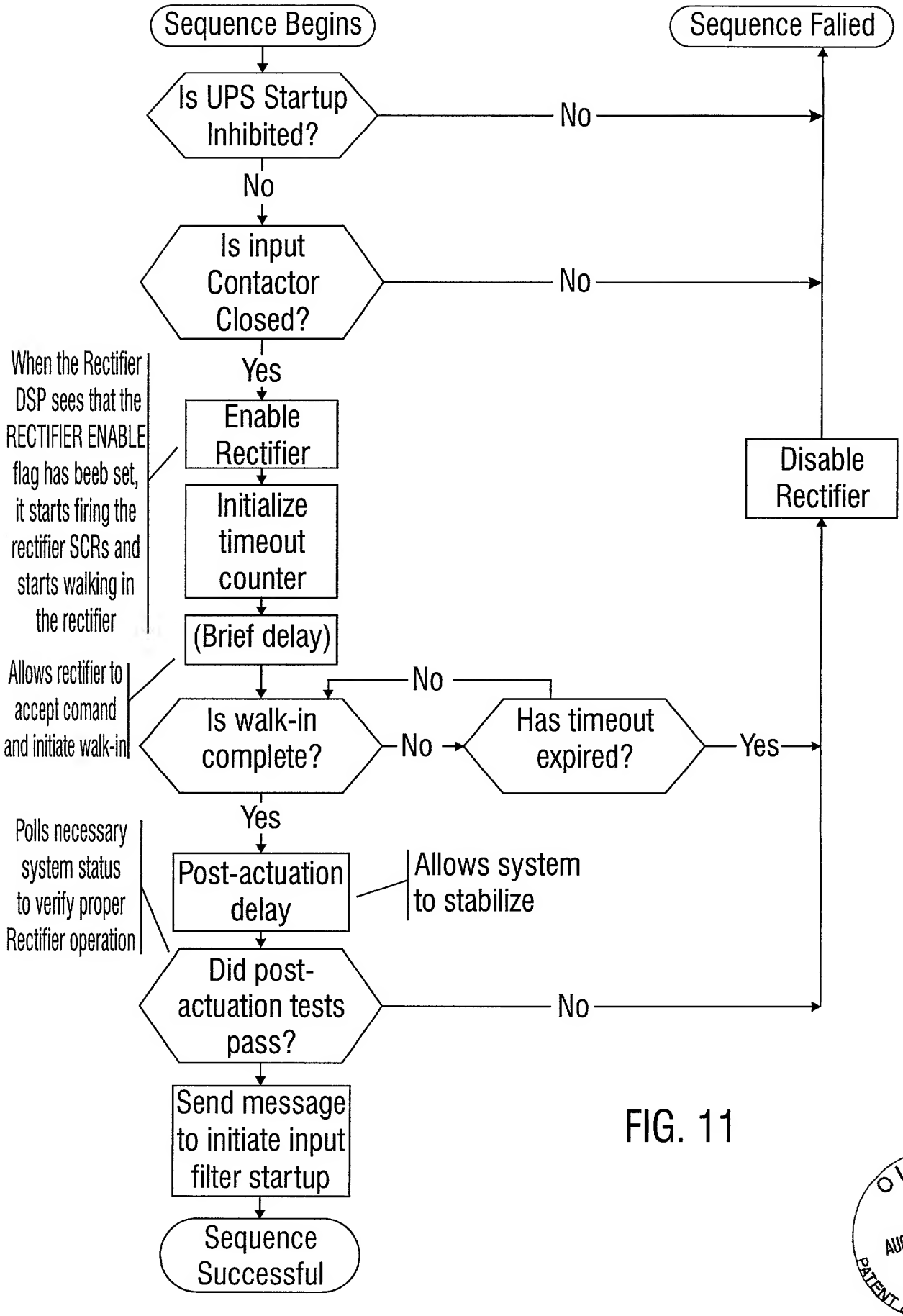



FIG. 11

OIPE JC109
AUG 0 1 2002
PATENT & TRADEMARK OFFICE

20F080 "S2/2002F

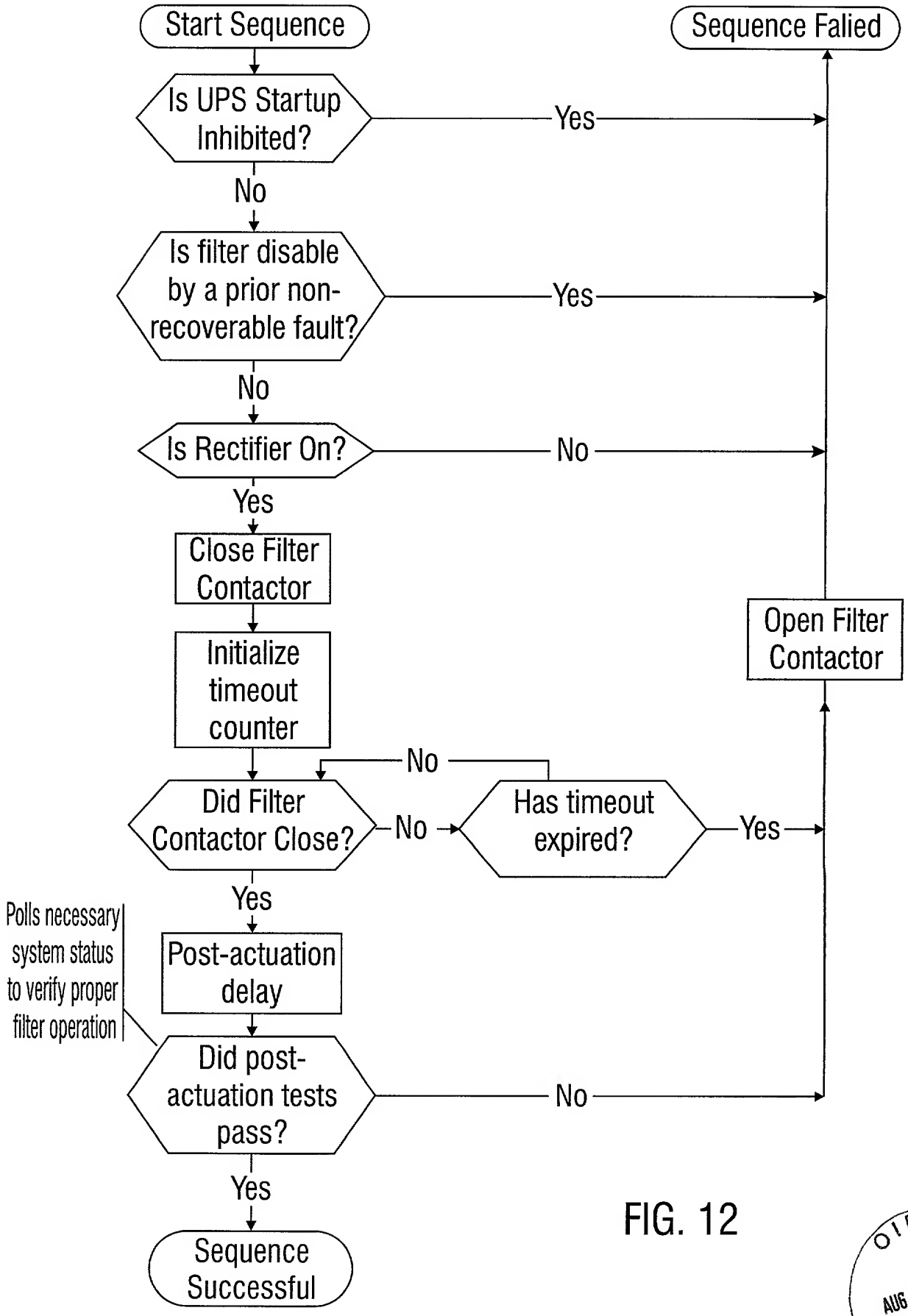



FIG. 12

OIPE JC109
AUG 01 2002
PATENT & TRADEMARK OFFICE

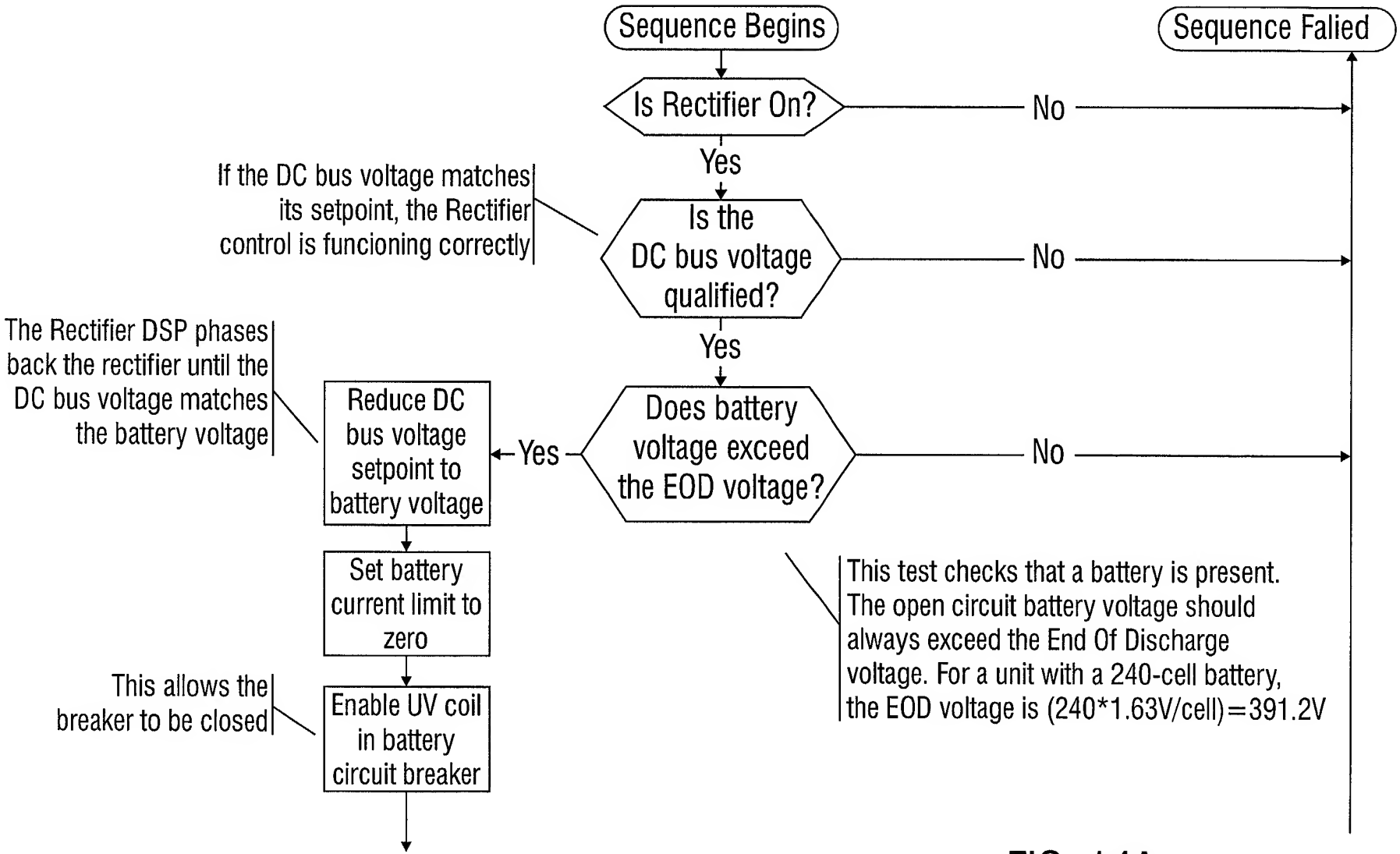



FIG. 14A

PATENT & TRADEMARK OFFICE
AUG 01 2002
OIPE
JC109

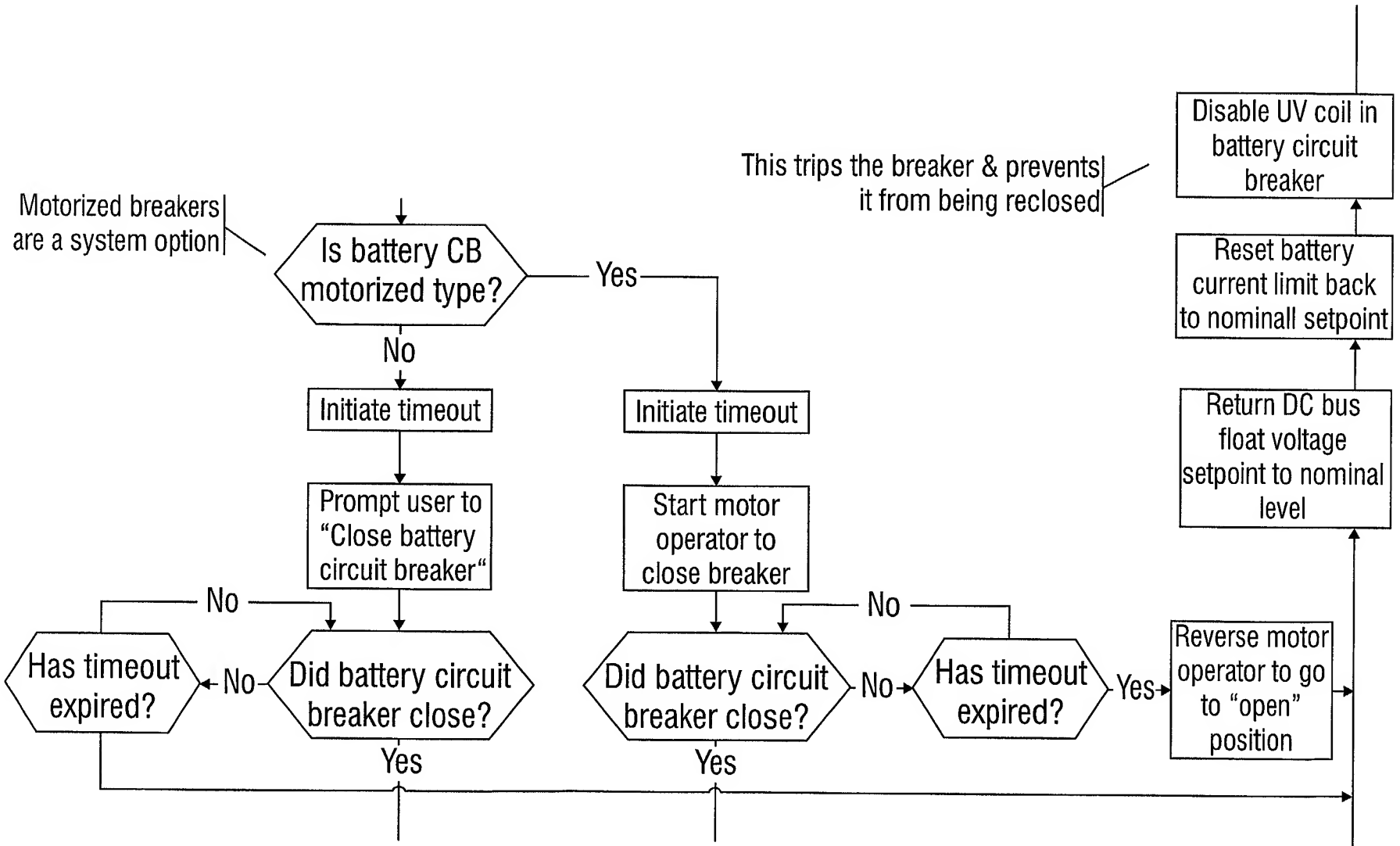



FIG. 14B

PATENT & TRADEMARK OFFICE OIPE AUG 01 2002 JC109

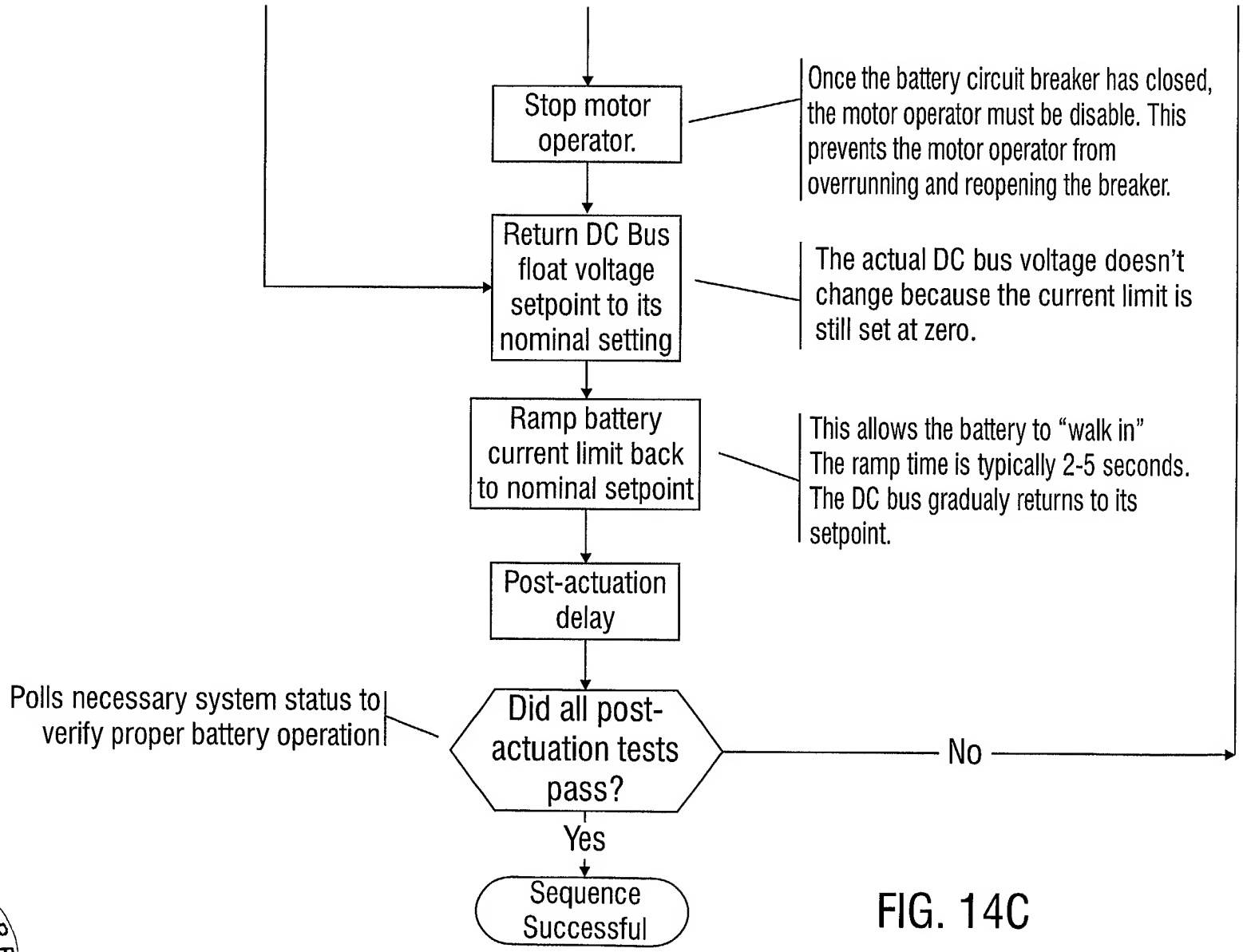



FIG. 14C

OIPE
AUG 0 1 2002
PATENT & TRADEMARK OFFICE 601-109

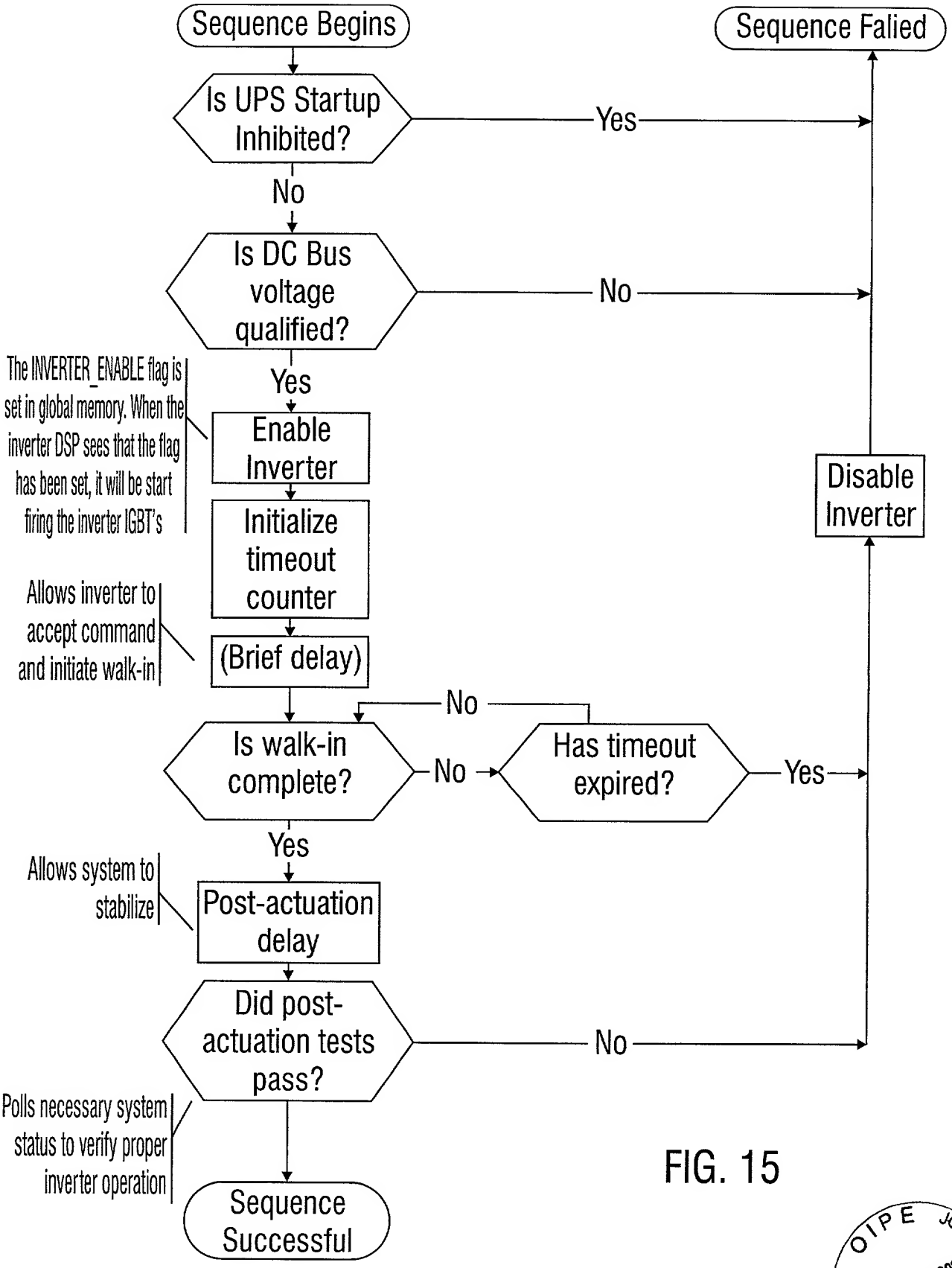
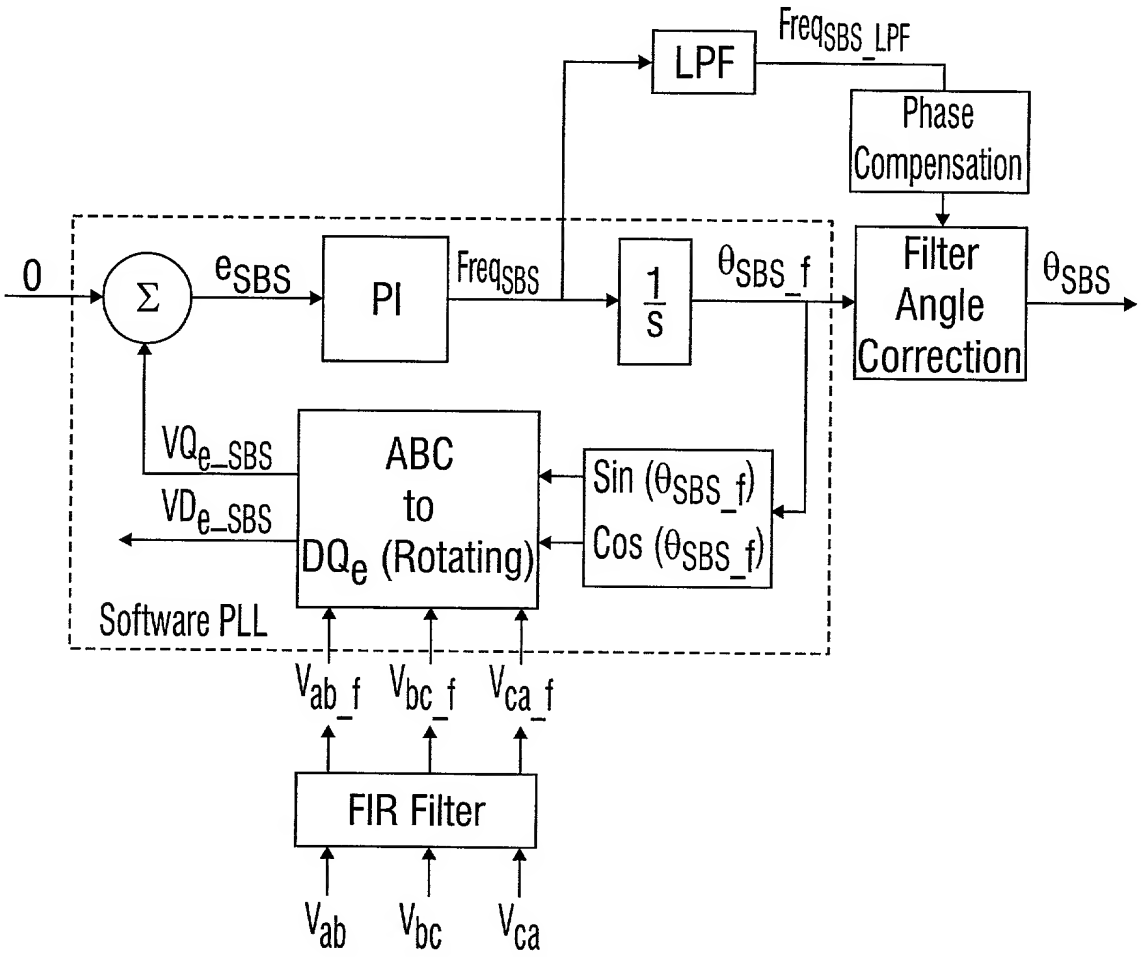



FIG. 15

OIPE JC109
AUG 0 1 2002
PATENT & TRADEMARK OFFICE

09/17/2002, EAST Version: 1.03.0002




Static Bypass Switch L-L Voltage

FIG. 16

OIPE JC109
AUG 01 2002
PATENT & TRADEMARK OFFICE

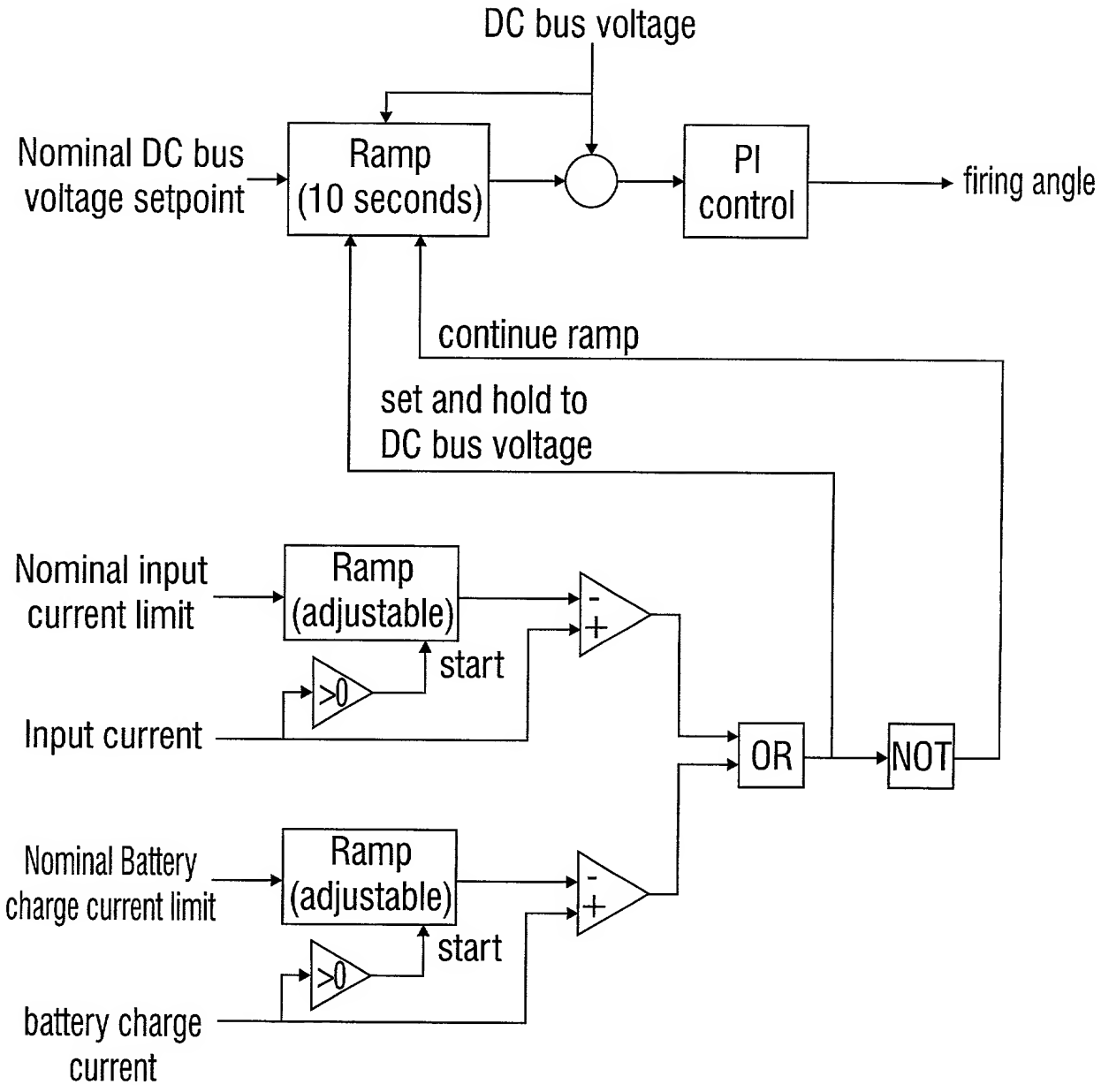



FIG. 17A

OIPE JC109
AUG 0 1 2002
PATENT & TRADEMARK OFFICE

30T080 "EZ2800T

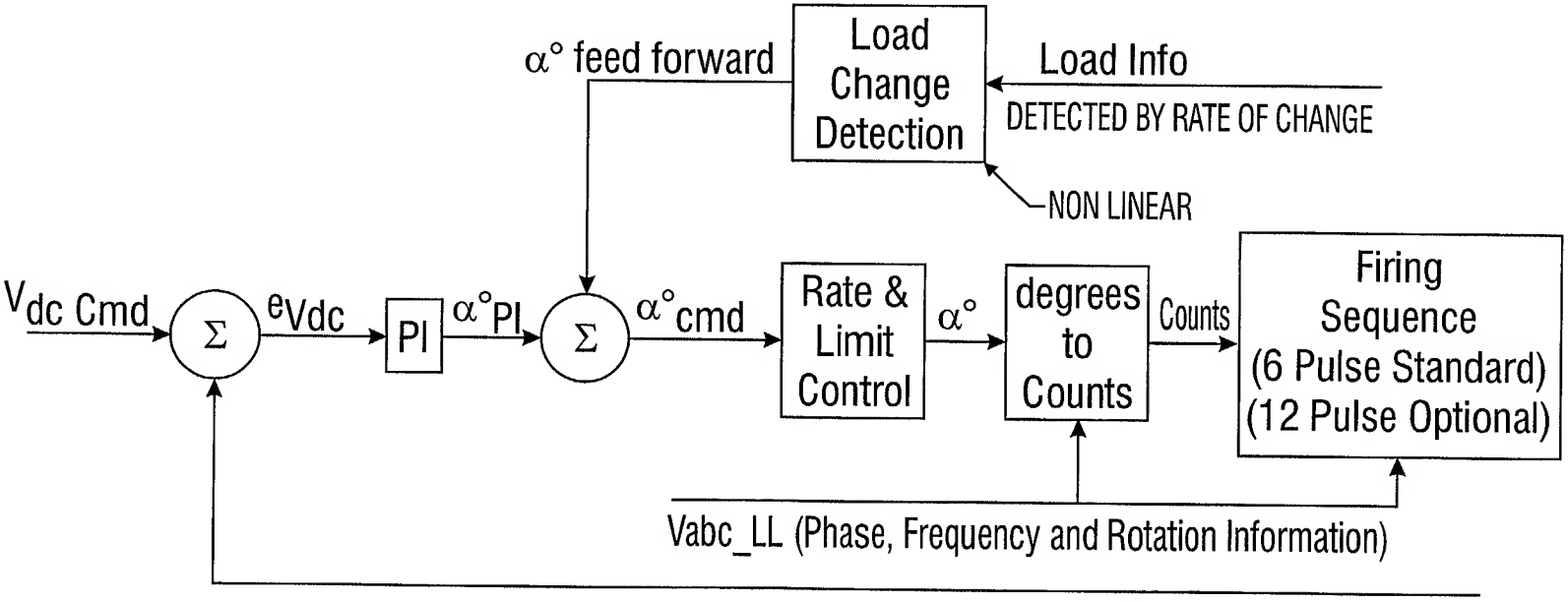



FIG. 17B

PATENT & TRADEMARK OFFICE
AUG 01 2002
OIPE
JC109

20020080-2/26/2002

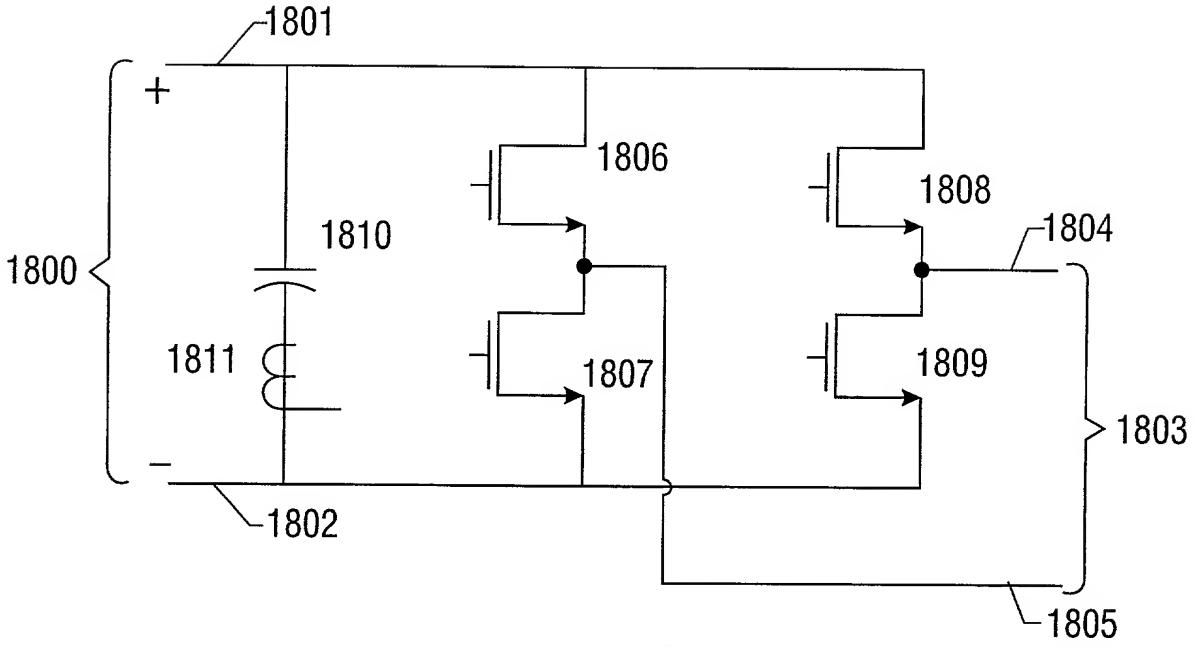



FIG. 18A

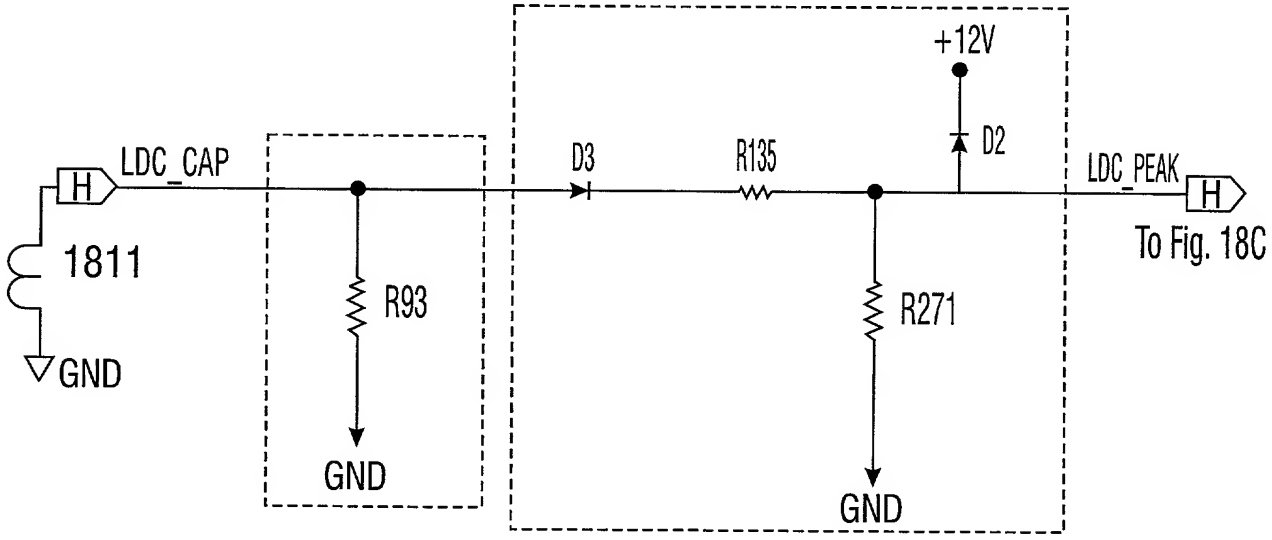



FIG. 18B

OIPE JC109
AUG 0 1 2002
PATENT & TRADEMARK OFFICE

30T080 "EZ2000F

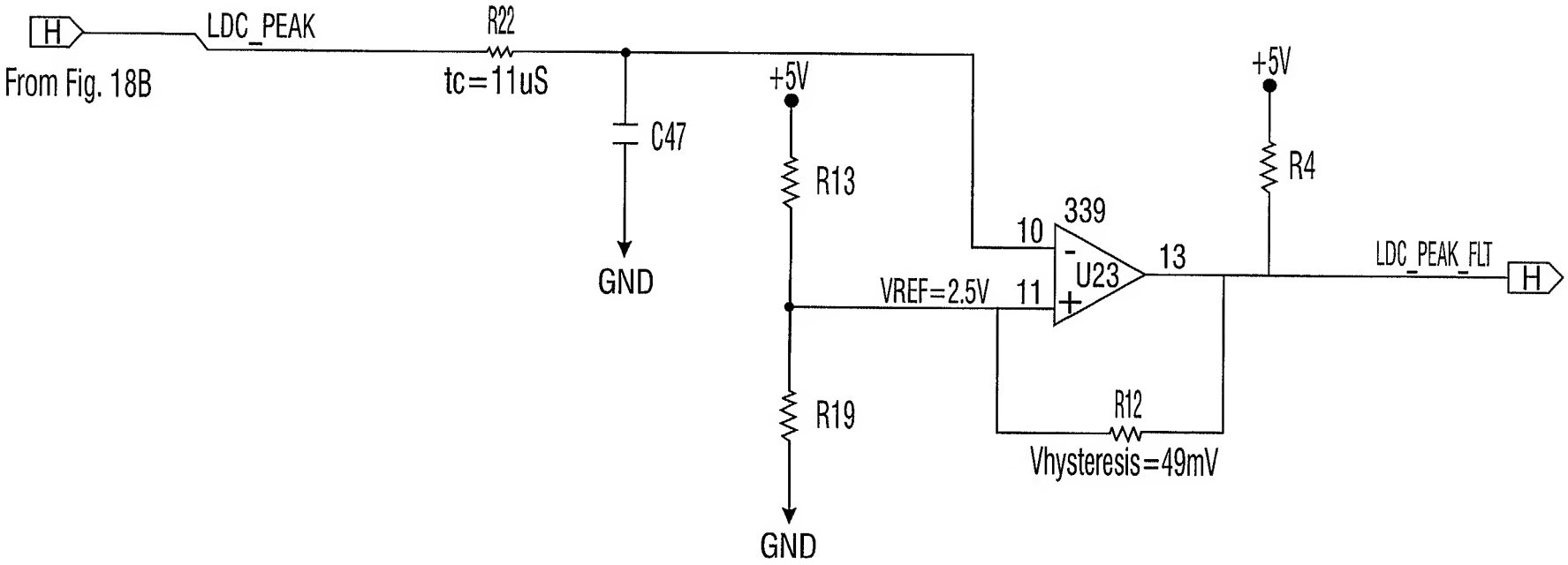



FIG. 18C

PATENT & TRADEMARK OFFICE
AUG 01 2002
OIPE
JC109

20-6363-5/2/2003-1

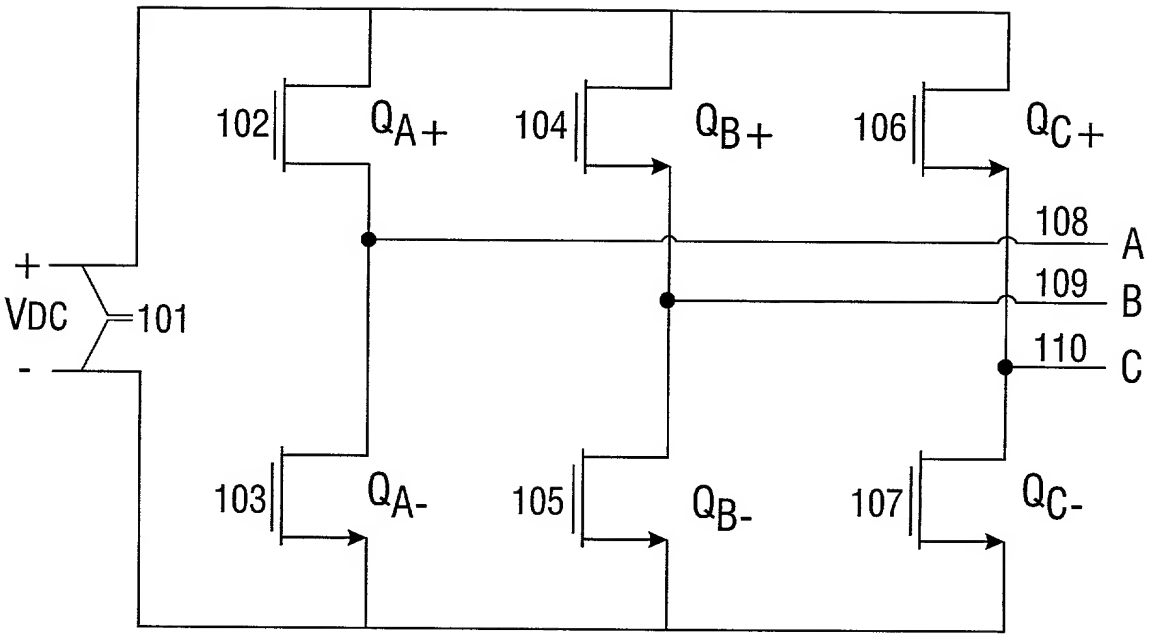



FIG. 19

OIPE
JC109
AUG 0 1 2002
PATENT & TRADEMARK OFFICE

| Switch (0=OFF, i=ON) | | | Line to Neutral Voltage Vectors | | | | | Line to Line Voltage Vectors | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $S_{C+}$ | $S_{B+}$ | $S_{A+}$ | $V_{AN}$ | $V_{BN}$ | $V_{CN}$ | $V=[V_{QS}\ V_{DS}]^T$ | Vector | $V_{AB}$ | $V_{BC}$ | $V_{CA}$ | $V=[V_{QS}\ V_{DS}]^T$ | Vector |
| 0 | 0 | 1 | $2/3\ V_{dc}$ | $-1/3\ V_{dc}$ | $-1/3\ V_{dc}$ | $2/3\ V_{dc}\angle 0°$ | $\overrightarrow{V_1}$ | $V_{dc}$ | 0 | $-V_{dc}$ | $2/\sqrt{3}\ V_{dc}\angle -30°$ | $\overrightarrow{V_1}$ |
| 1 | 0 | 1 | $1/3\ V_{dc}$ | $-2/3\ V_{dc}$ | $1/3\ V_{dc}$ | $2/3\ V_{dc}\angle 60°$ | $\overrightarrow{V_2}$ | $V_{dc}$ | $-V_{dc}$ | 0 | $2/\sqrt{3}\ V_{dc}\angle 30°$ | $\overrightarrow{V_2}$ |
| 1 | 0 | 0 | $-1/3\ V_{dc}$ | $-1/3\ V_{dc}$ | $2/3\ V_{dc}$ | $2/3\ V_{dc}\angle 120°$ | $\overrightarrow{V_3}$ | 0 | $-V_{dc}$ | $V_{dc}$ | $2/\sqrt{3}\ V_{dc}\angle 90°$ | $\overrightarrow{V_3}$ |
| 1 | 1 | 0 | $-2/3\ V_{dc}$ | $1/3\ V_{dc}$ | $1/3\ V_{dc}$ | $2/3\ V_{dc}\angle 180°$ | $\overrightarrow{V_4}$ | $-V_{dc}$ | 0 | $V_{dc}$ | $2/\sqrt{3}\ V_{dc}\angle 150°$ | $\overrightarrow{V_4}$ |
| 0 | 1 | 0 | $-1/3\ V_{dc}$ | $2/3\ V_{dc}$ | $-1/3\ V_{dc}$ | $2/3\ V_{dc}\angle 240°$ | $\overrightarrow{V_5}$ | $-V_{dc}$ | $V_{dc}$ | 0 | $2/\sqrt{3}\ V_{dc}\angle 210°$ | $\overrightarrow{V_5}$ |
| 0 | 1 | 1 | $1/3\ V_{dc}$ | $1/3\ V_{dc}$ | $-2/3\ V_{dc}$ | $2/3\ V_{dc}\angle 300°$ | $\overrightarrow{V_6}$ | 0 | $V_{dc}$ | $-V_{dc}$ | $2/\sqrt{3}\ V_{dc}\angle 270°$ | $\overrightarrow{V_6}$ |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | $\overrightarrow{V_7}$ | 0 | 0 | 0 | 0 | $\overrightarrow{V_7}$ |
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | $\overrightarrow{V_8}$ | 0 | 0 | 0 | 0 | $\overrightarrow{V_8}$ |

FIG. 20

PATENT & TRADEMARK OFFICE
AUG 01 2002
OIPE
JC109

20F080-EV20600T

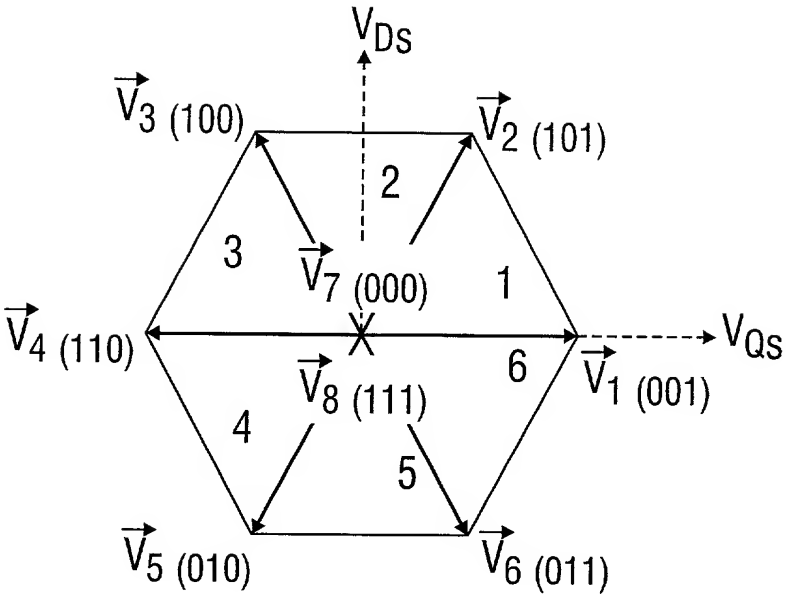



FIG. 21A

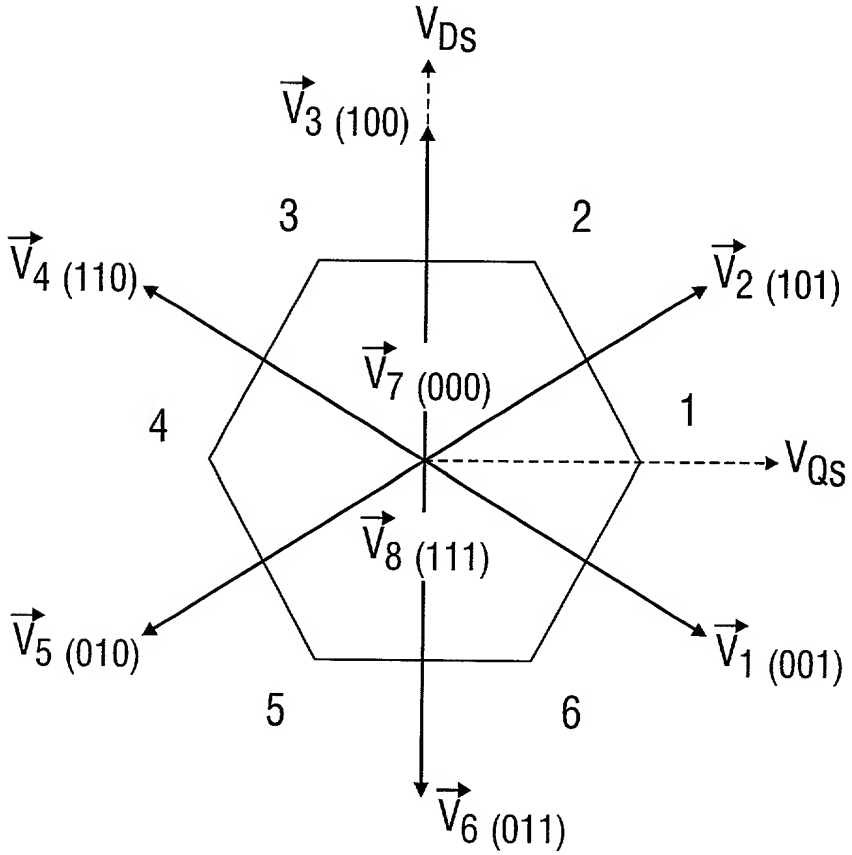



FIG. 21B

OIPE JC1109
AUG 0 1 2002
PATENT & TRADEMARK OFFICE

P26656-US-2002-08-01

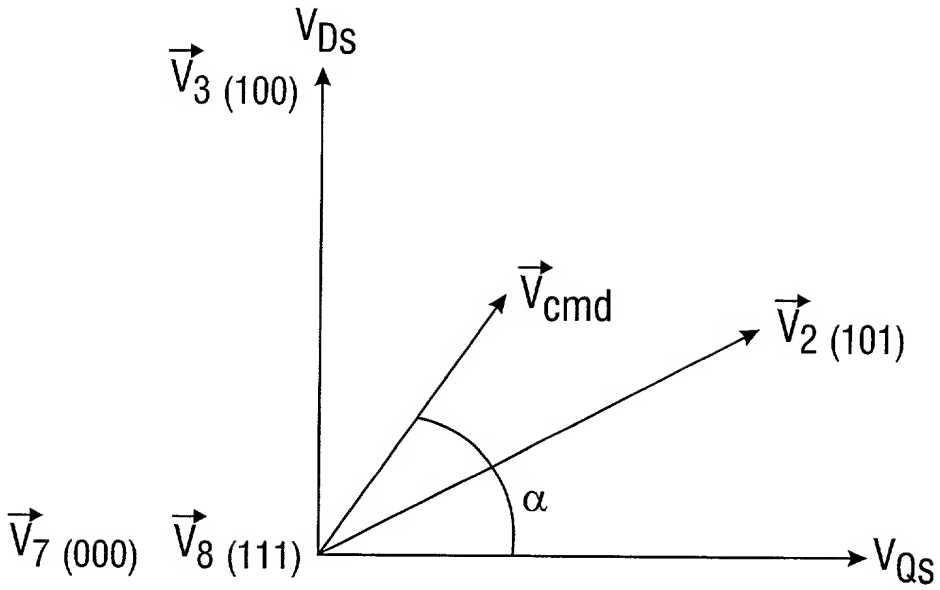



FIG. 22A

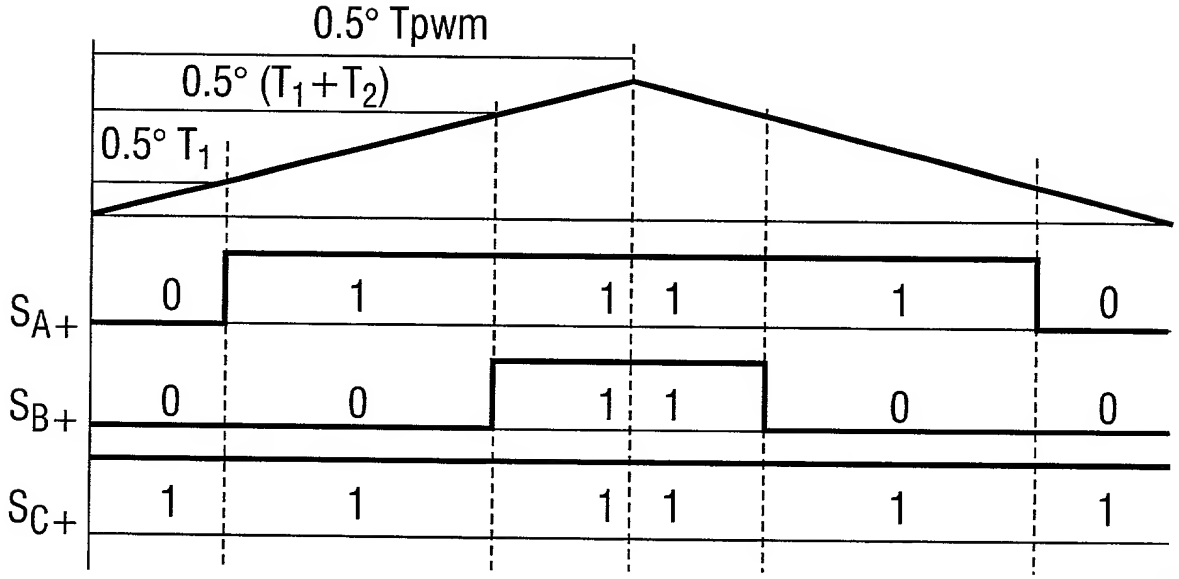



FIG. 22B

OIPE JC109
AUG 0 1 2002
PATENT & TRADEMARK OFFICE

20F3860 "SC2000F

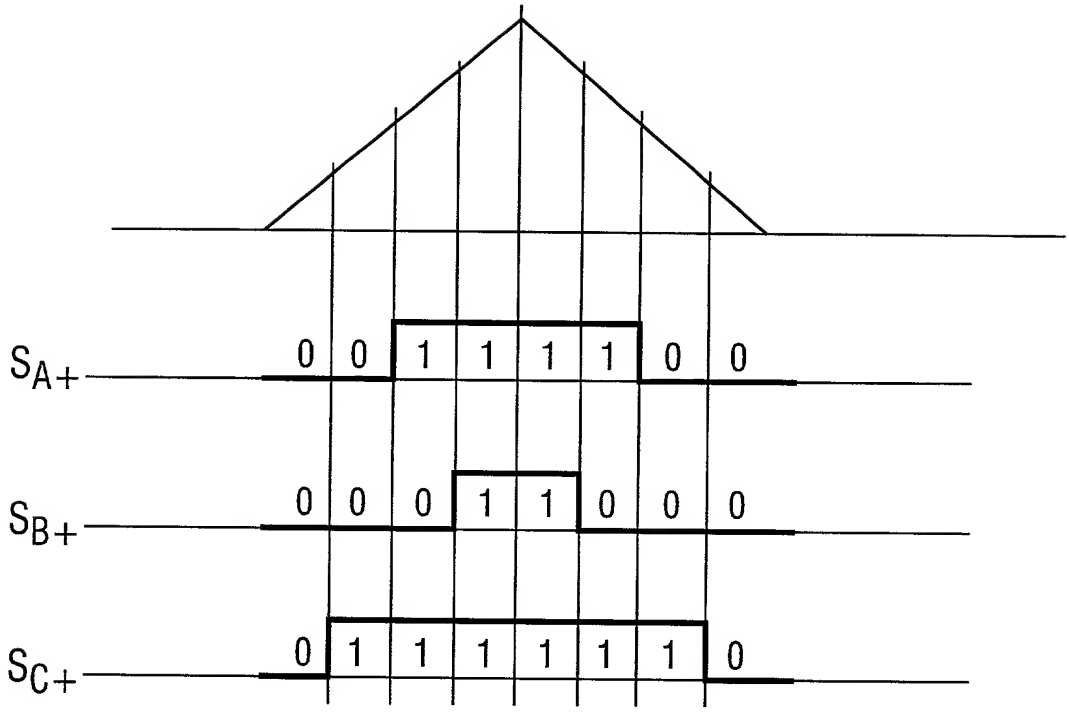



FIG. 22C

OIPE JC109
AUG 0 1 2002
PATENT & TRADEMARK OFFICE

20T080 "E73/080T

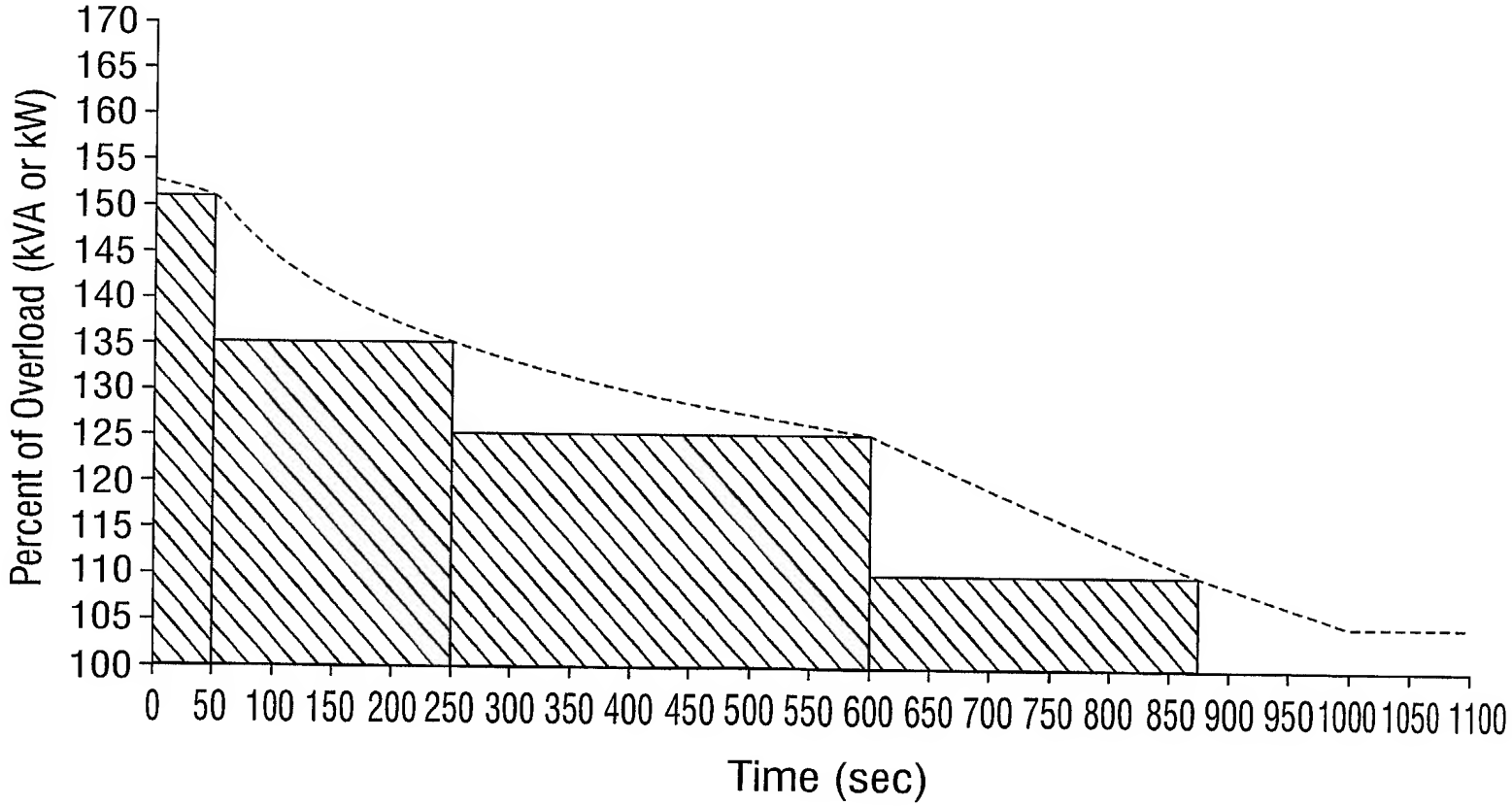



FIG. 23

PATENT & TRADEMARK OFFICE
AUG 01 2002
OIPE
JC109

20F080 "E232003F

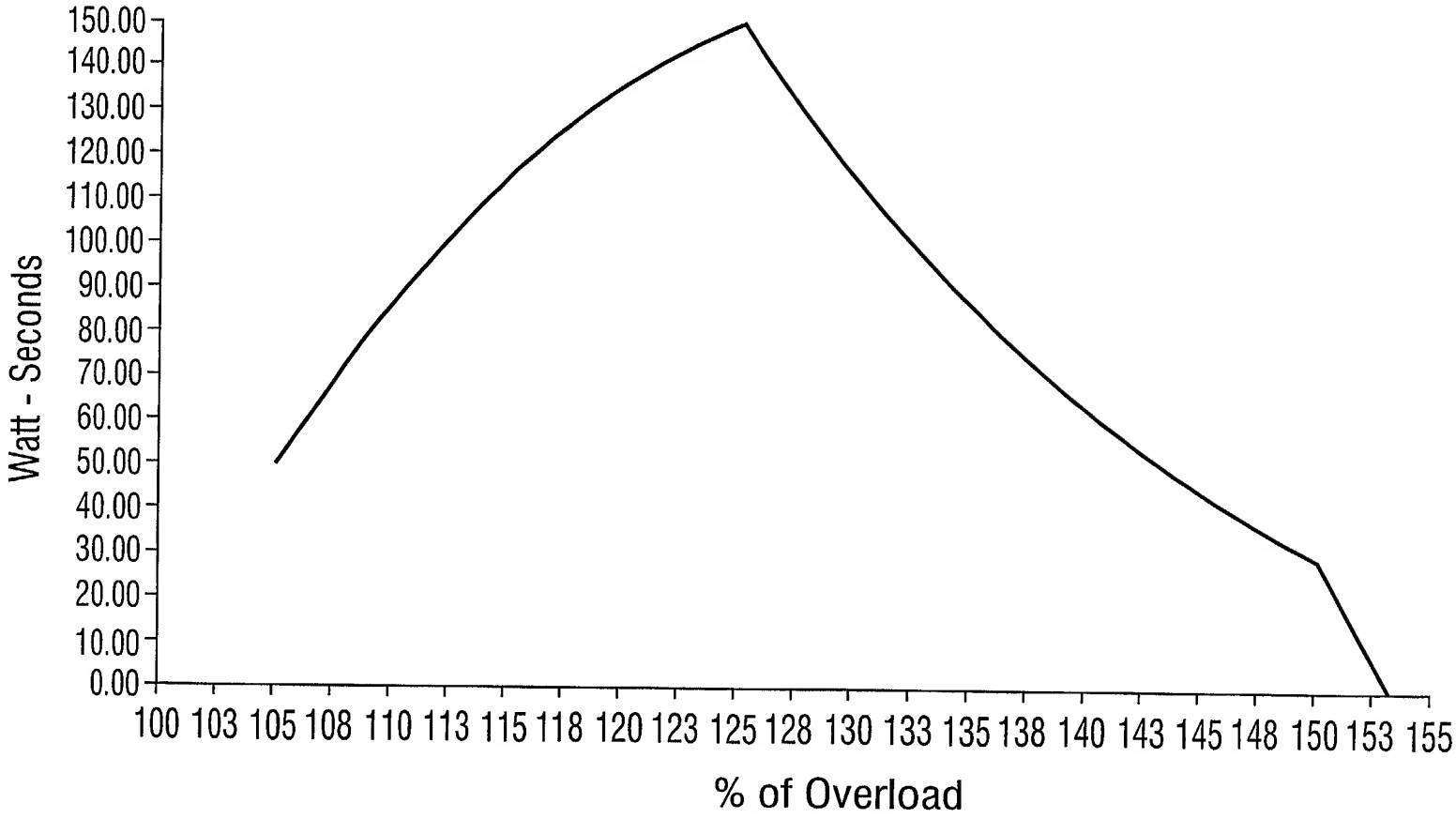



FIG. 24

PATENT & TRADEMARK OFFICE
AUG 01 2002
OIPE
JC109

PATENT & TRADEMARK OFFICE
AUG 01 2002
OIPE
JC109

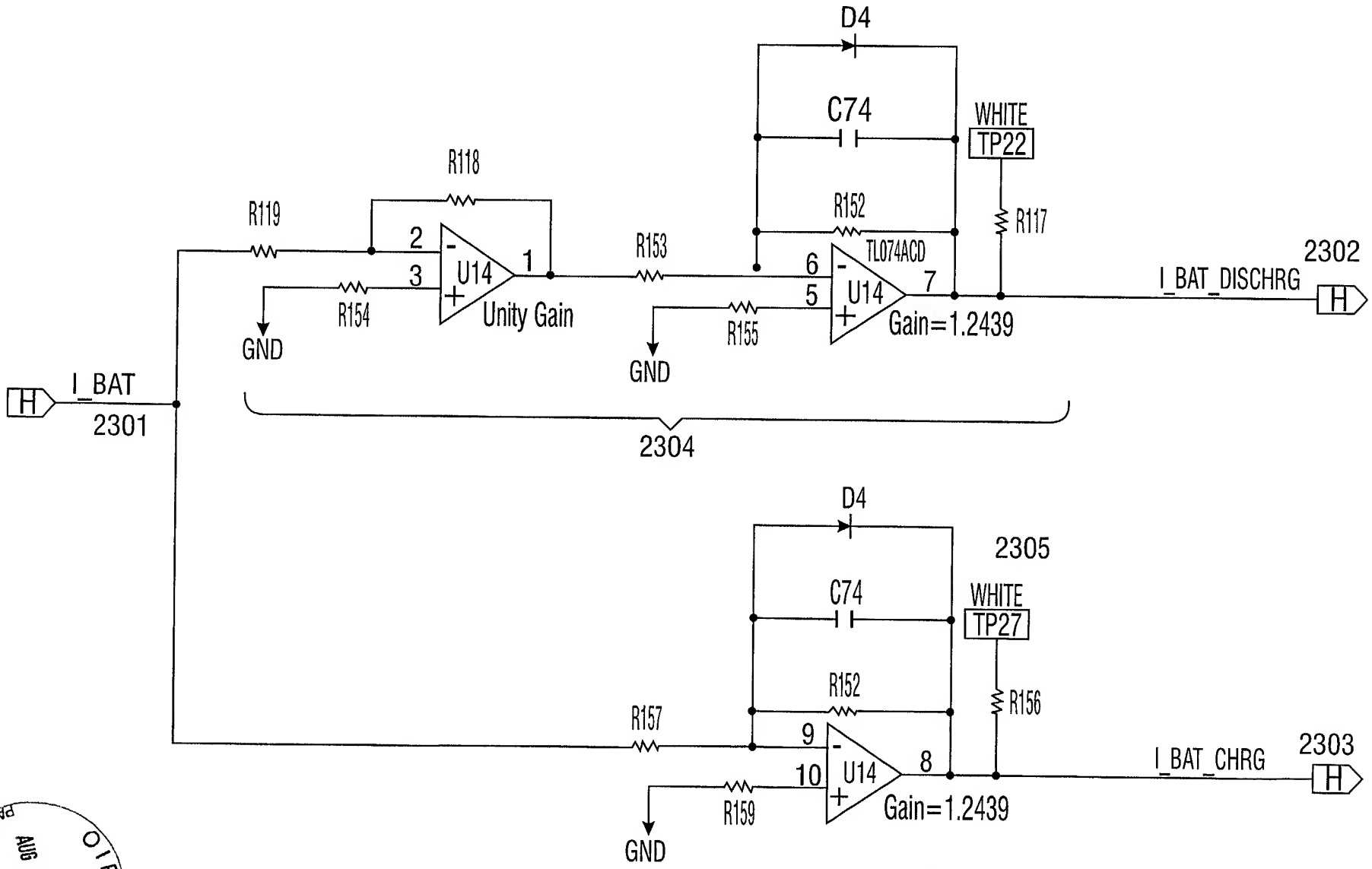



FIG. 25

20T080 "E2E0001

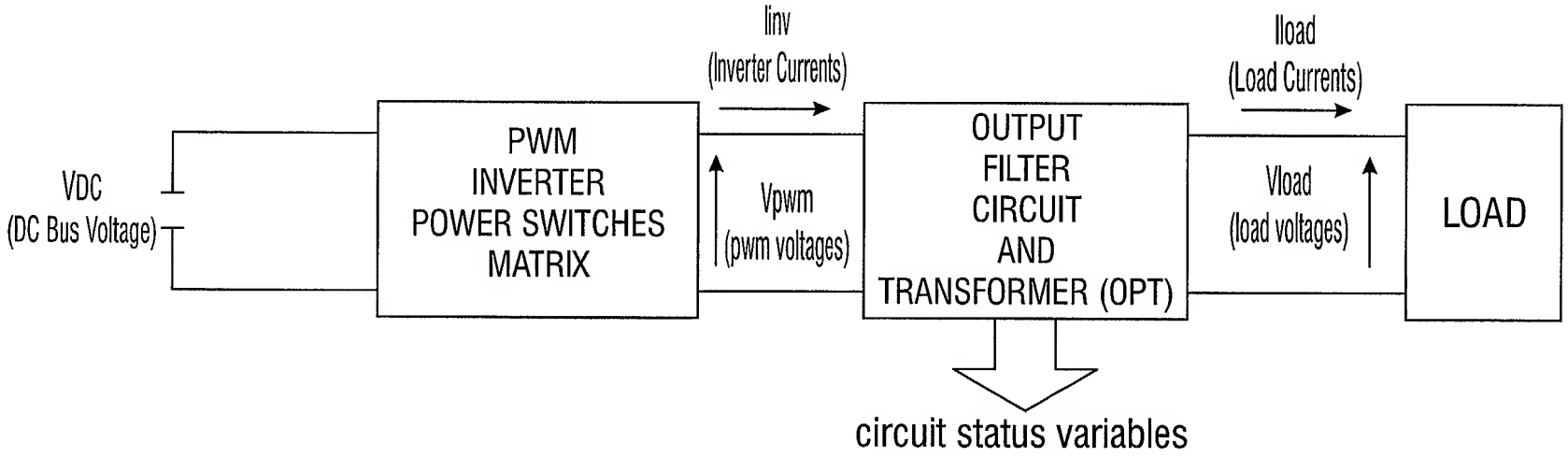



FIG. 26

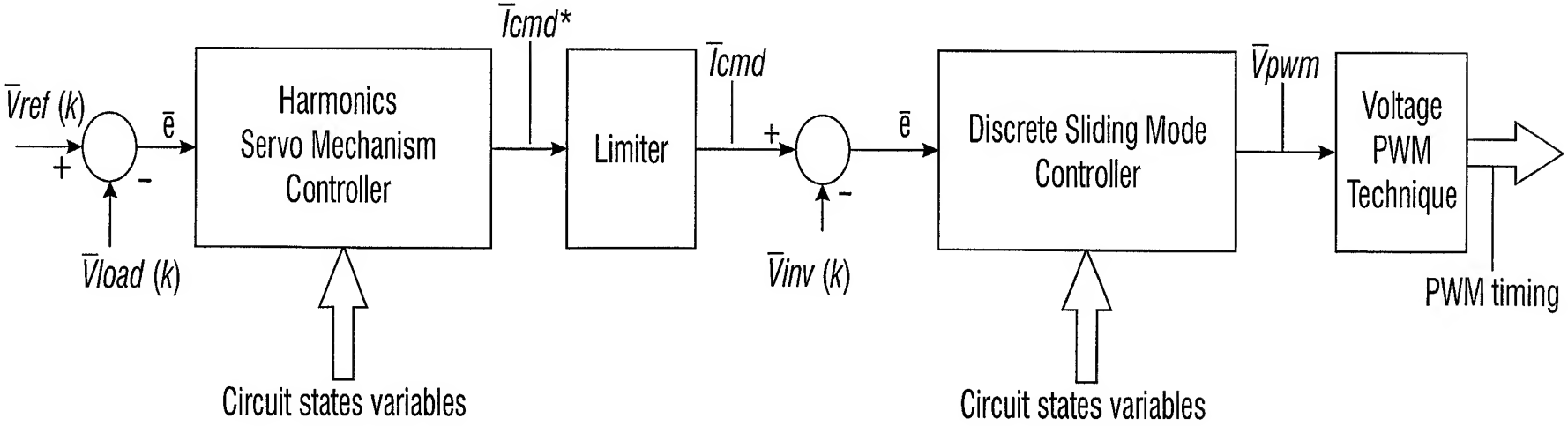



FIG. 27

PATENT & TRADEMARK OFFICE
AUG 0 1 2002
OIPE
JC109

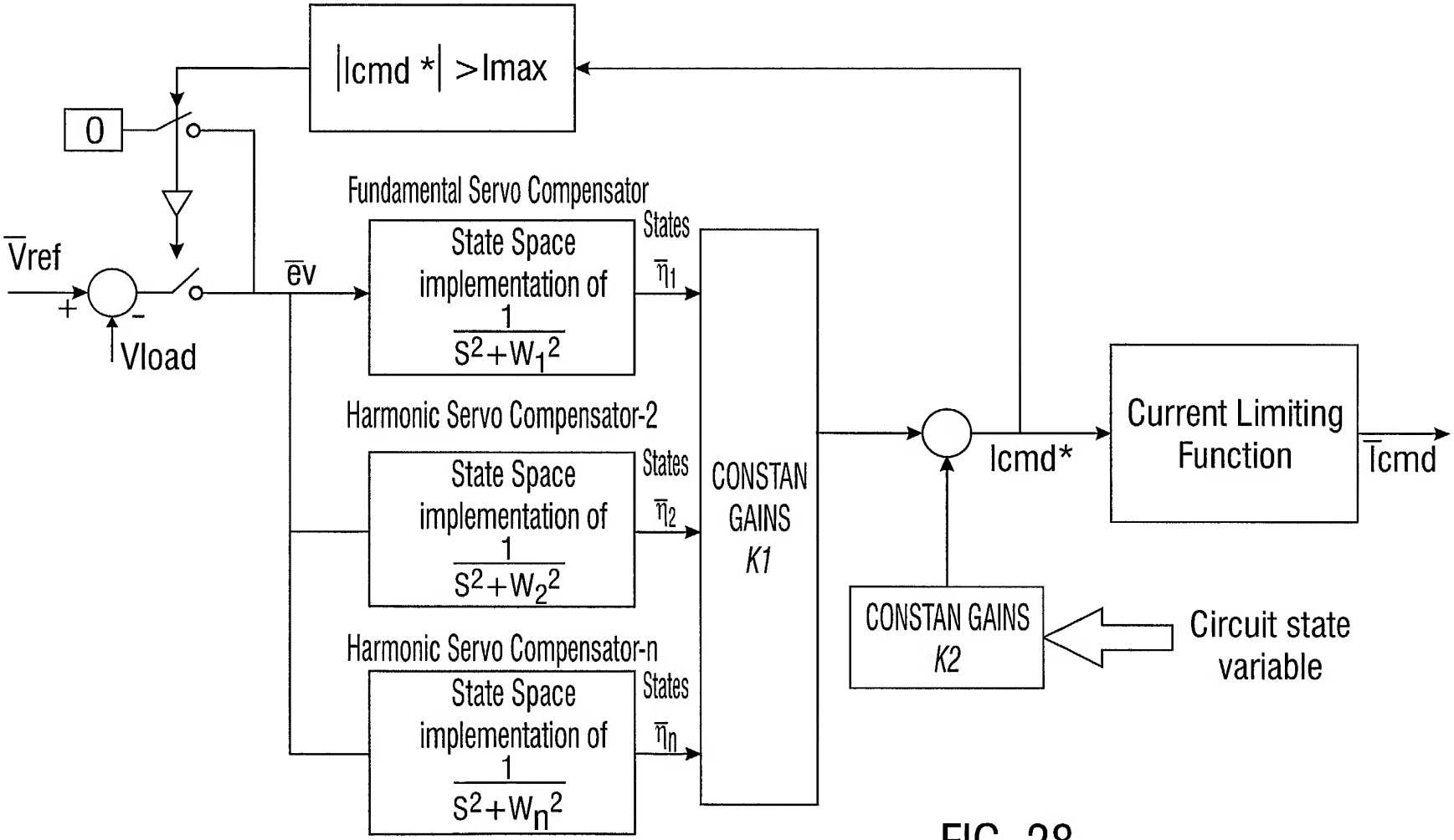



FIG. 28

PATENT & TRADEMARK OFFICE OIPE AUG 0 1 2002 JC109

20T080" EZ2000F

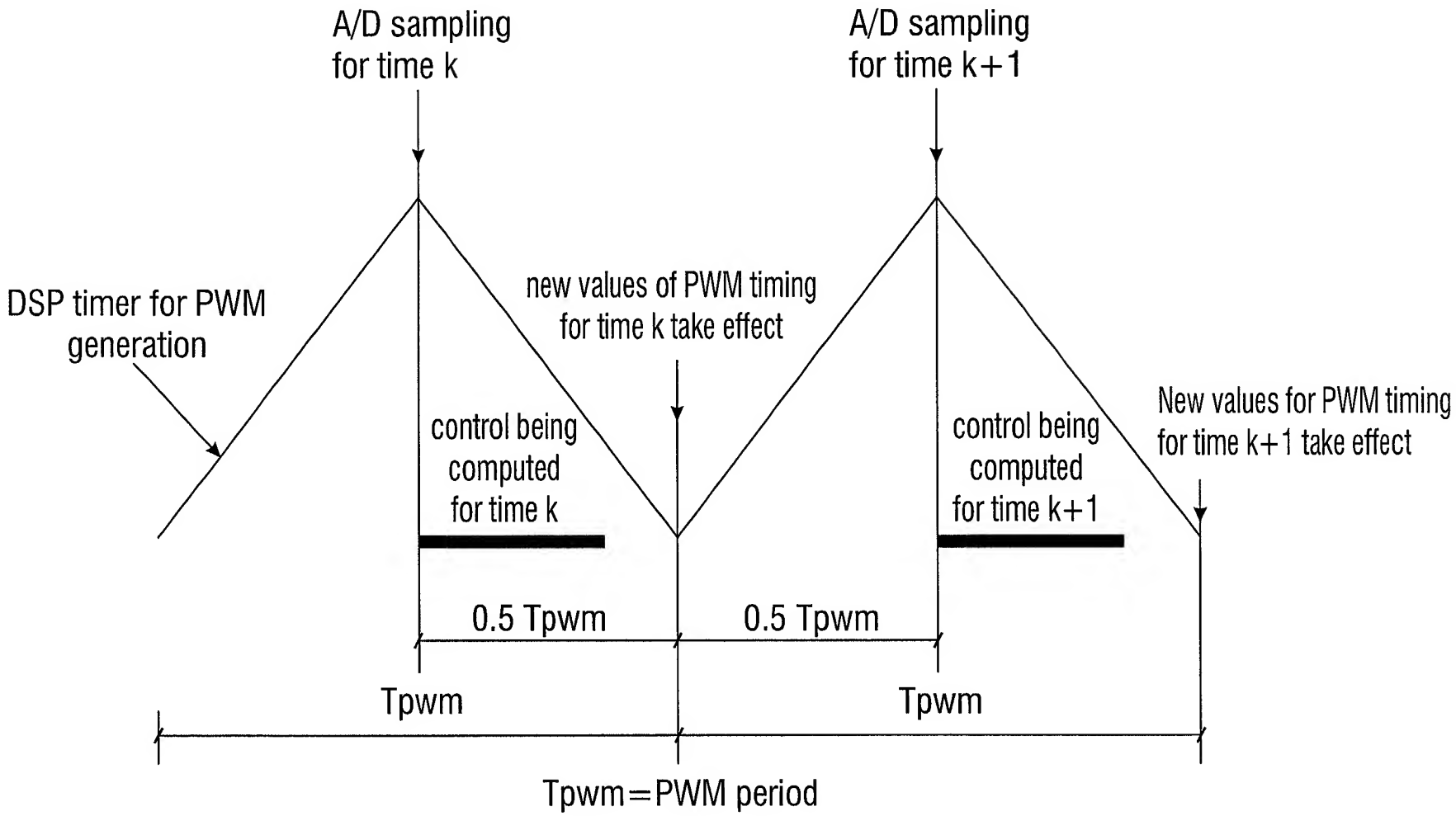



FIG. 29

PATENT & TRADEMARK OFFICE
AUG 01 2002
OIPE
JC109

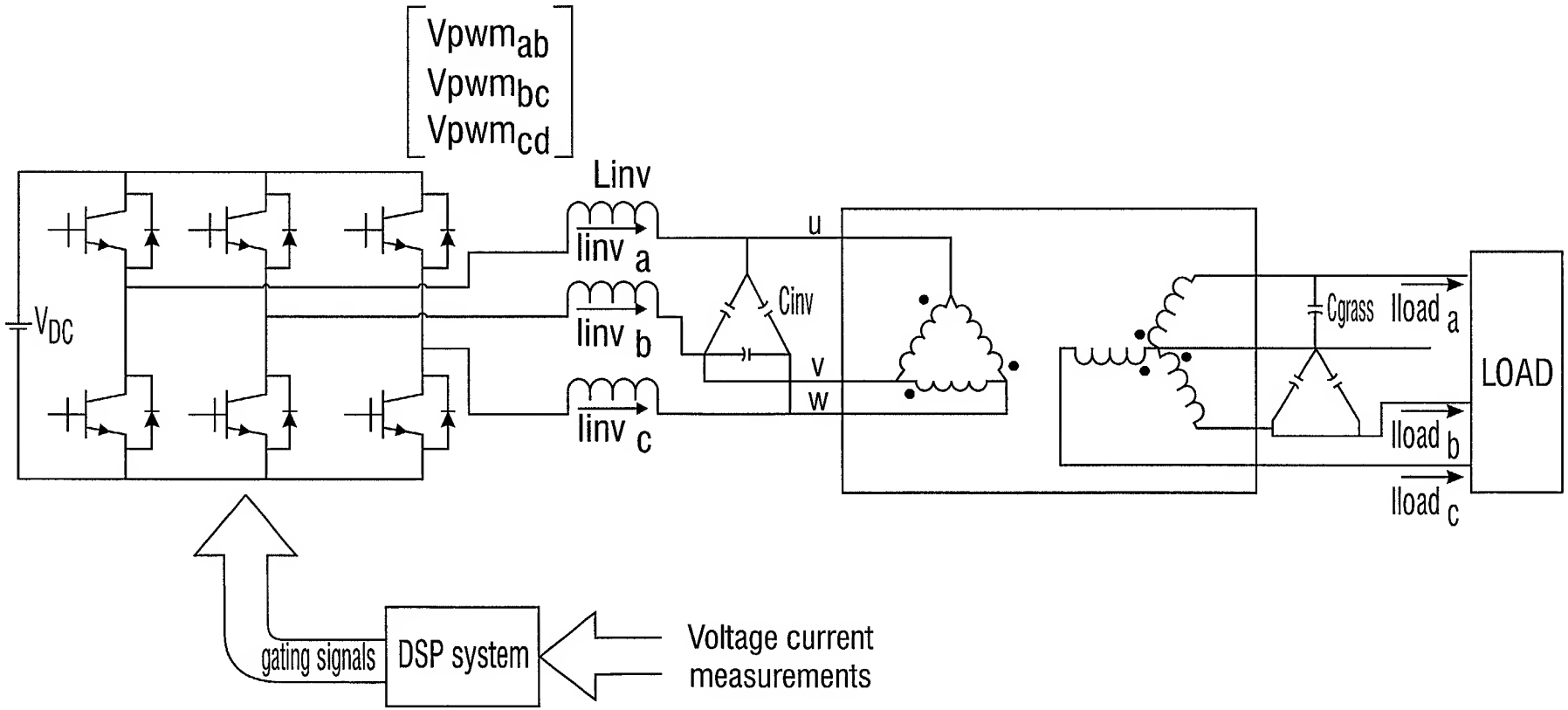



FIG. 30

PATENT & TRADEMARK OFFICE OIPE AUG 01 2002 JC109

20F869 "62/2002

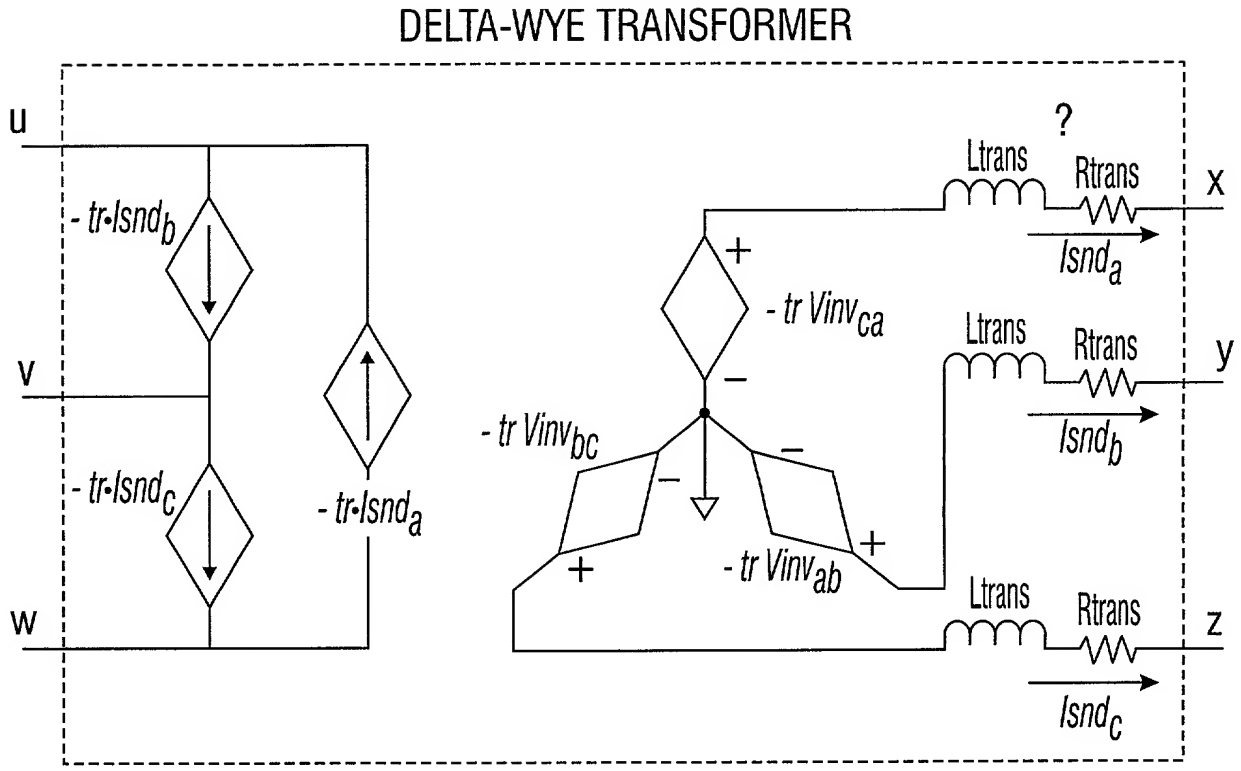



FIG. 31

OIPE JC100
AUG 0 1 2002
PATENT & TRADEMARK OFFICE

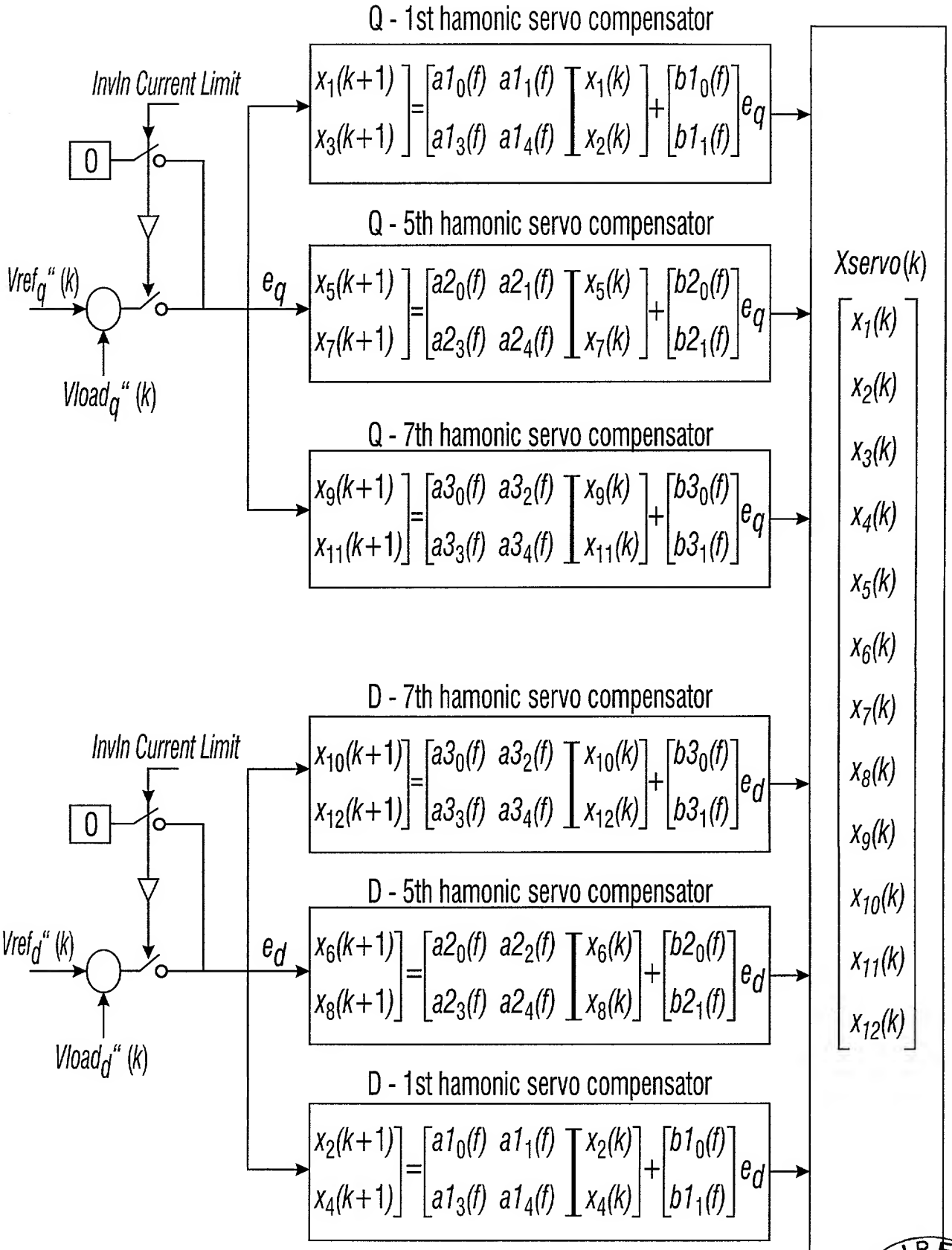



FIG. 32

20T888 S/22/2002T

OIPE YC109
AUG 01 2002
PATENT & TRADEMARK OFFICE

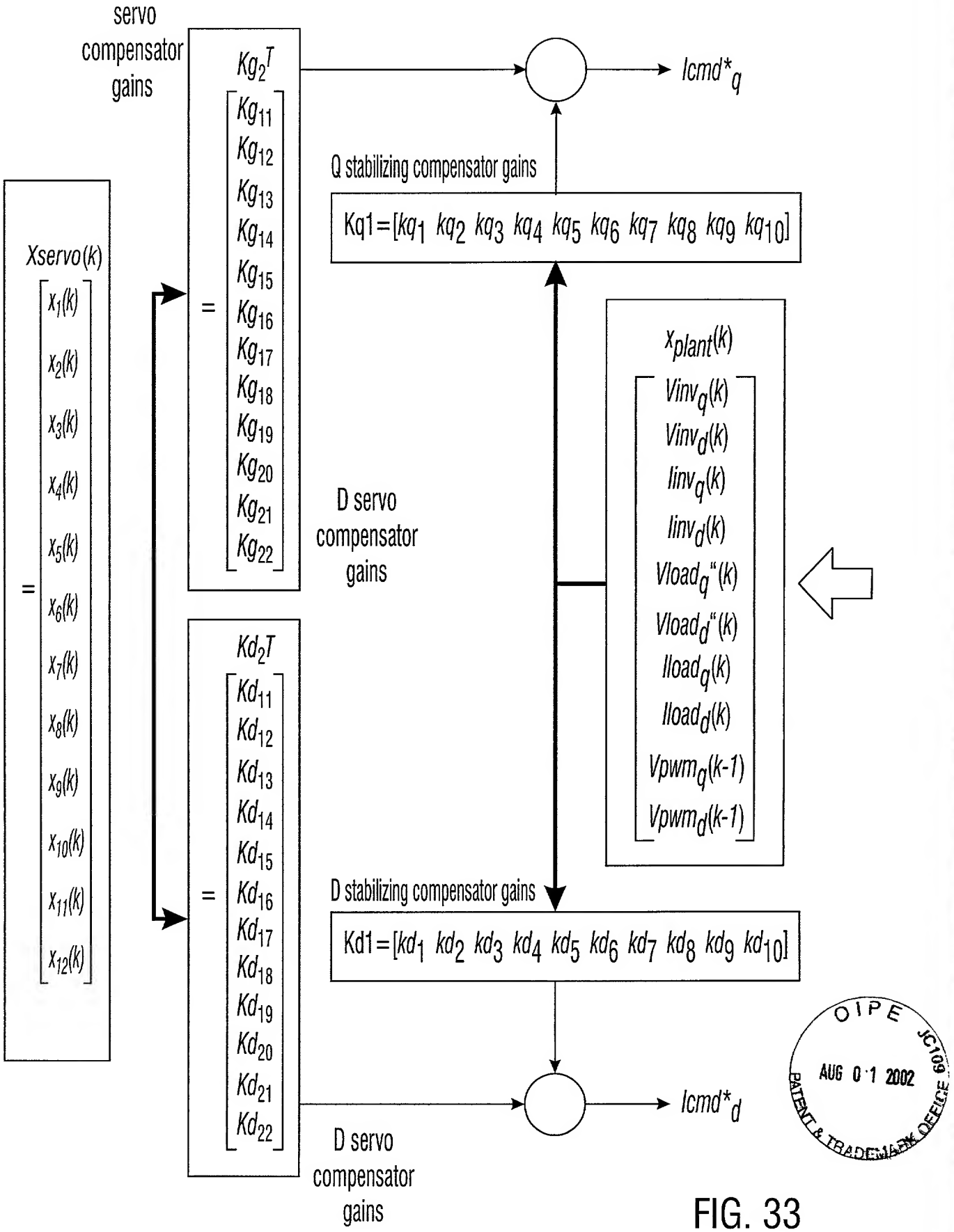



FIG. 33

OIPE JC109 AUG 01 2002 PATENT & TRADEMARK OFFICE

20T080 "E2Z0001

| | | |
|---|---|---|
| FIG. 35A-1 | FIG. 35A-2 | |
| FIG. 35A-3 | FIG. 35A-4 | FIG. 35A-5 |
| FIG. 35A-6 | FIG. 35A-7 | |

FIG. 35A

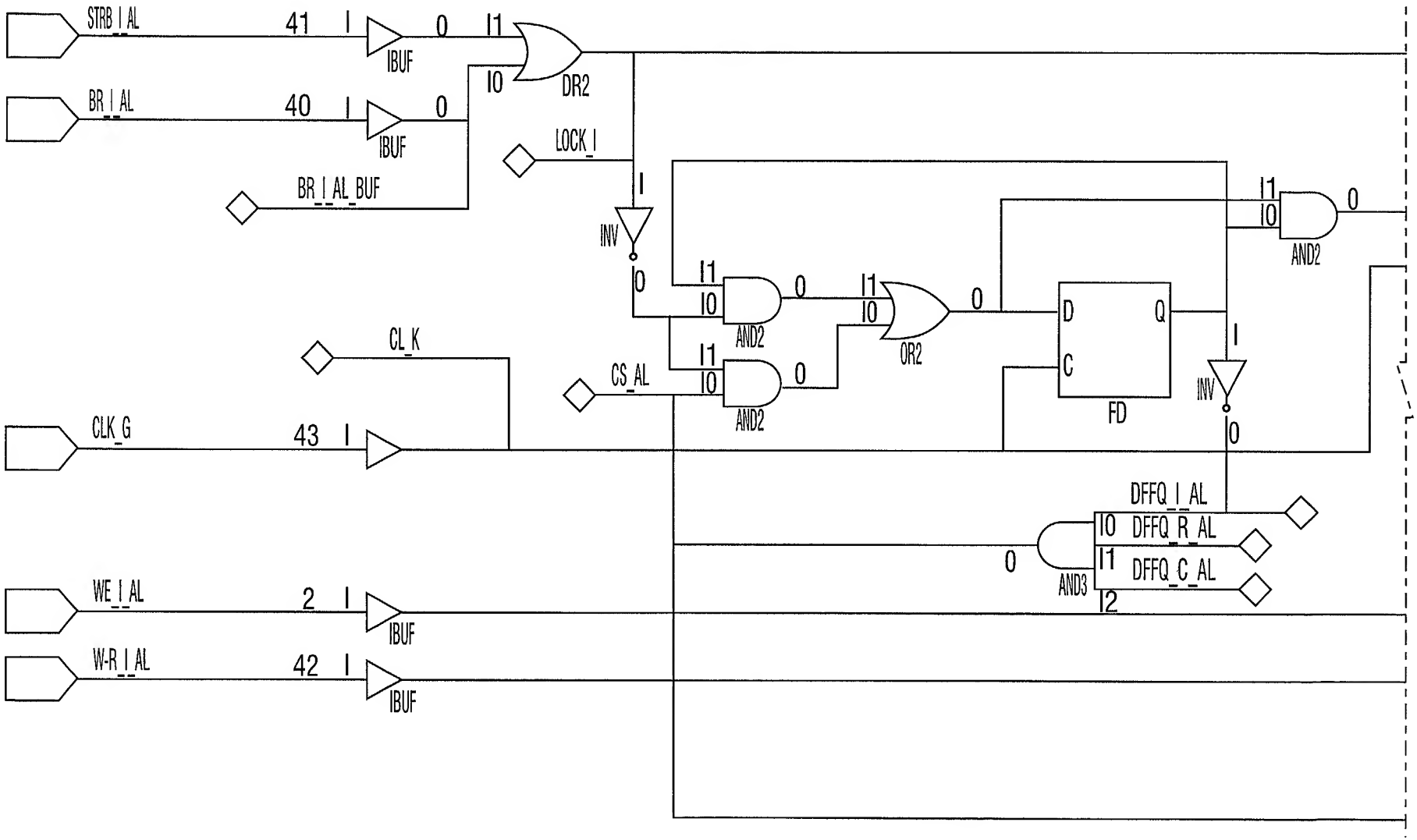



FIG. 35A-1

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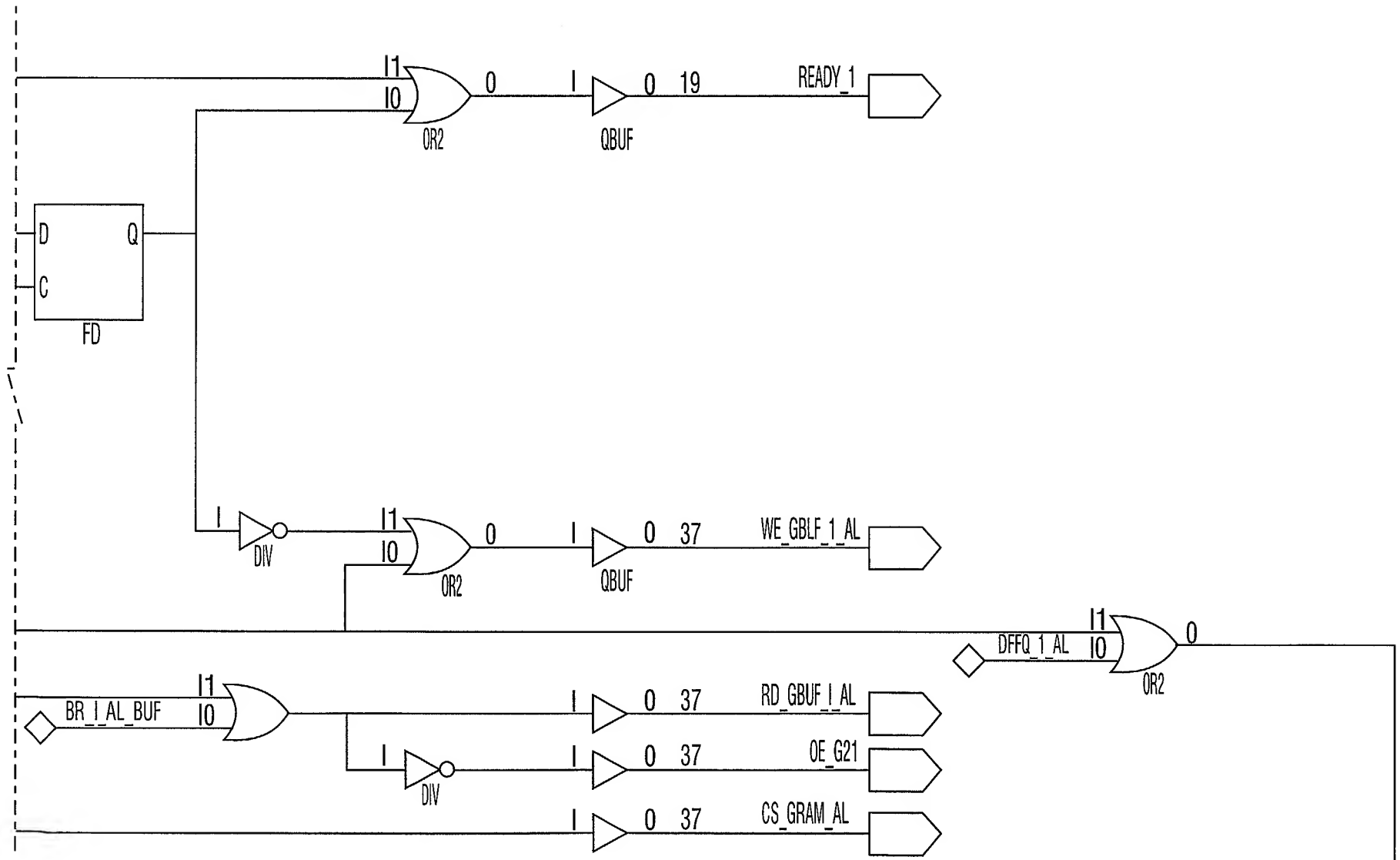


FIG. 35A-2

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20T080 "E282000T

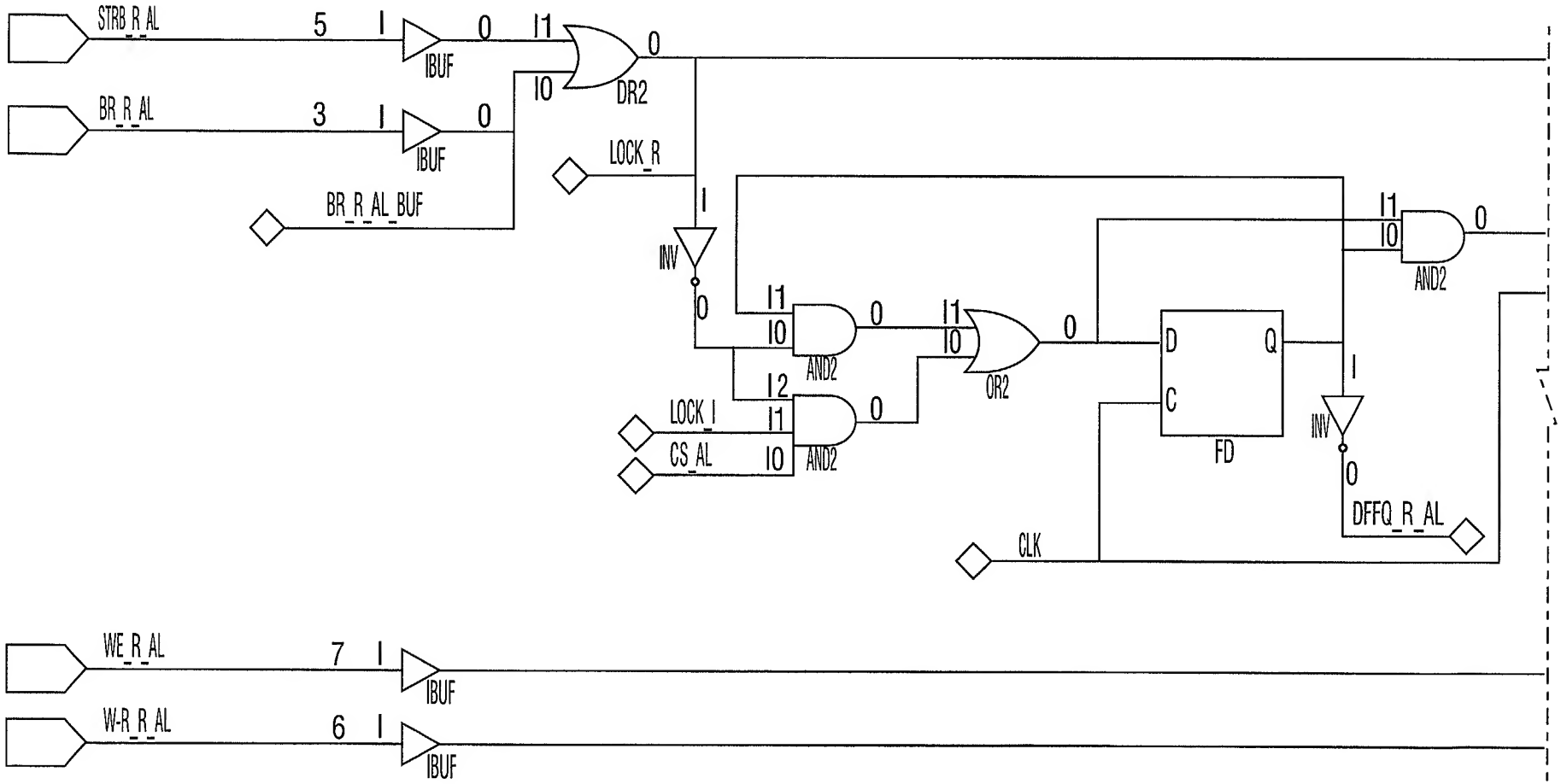


FIG. 35A-3

PATENT & TRADEMARK OFFICE OIPE AUG 0 1 2002

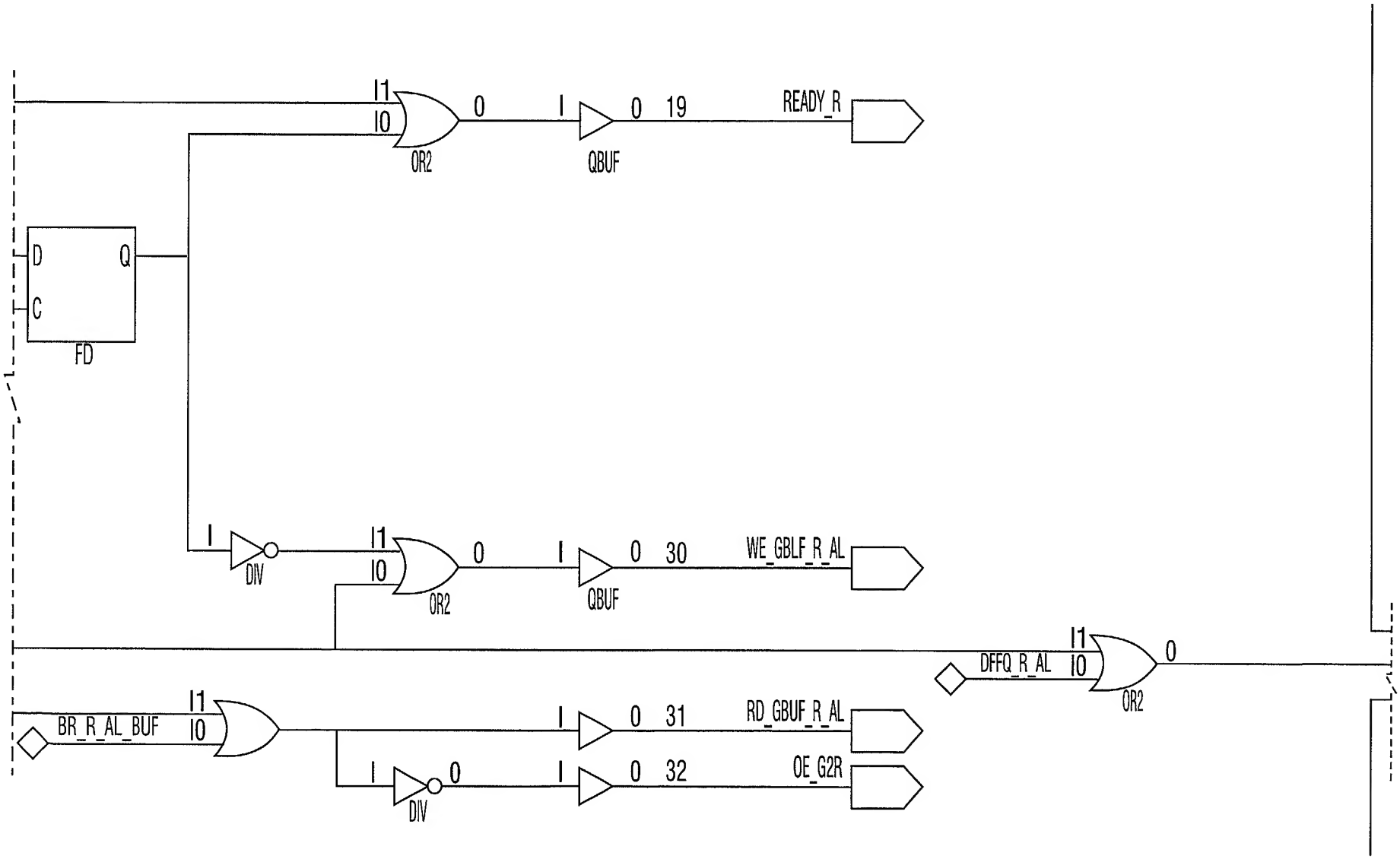


FIG. 35A-4

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OIPE
JC109

20T080 "E2E2C0001

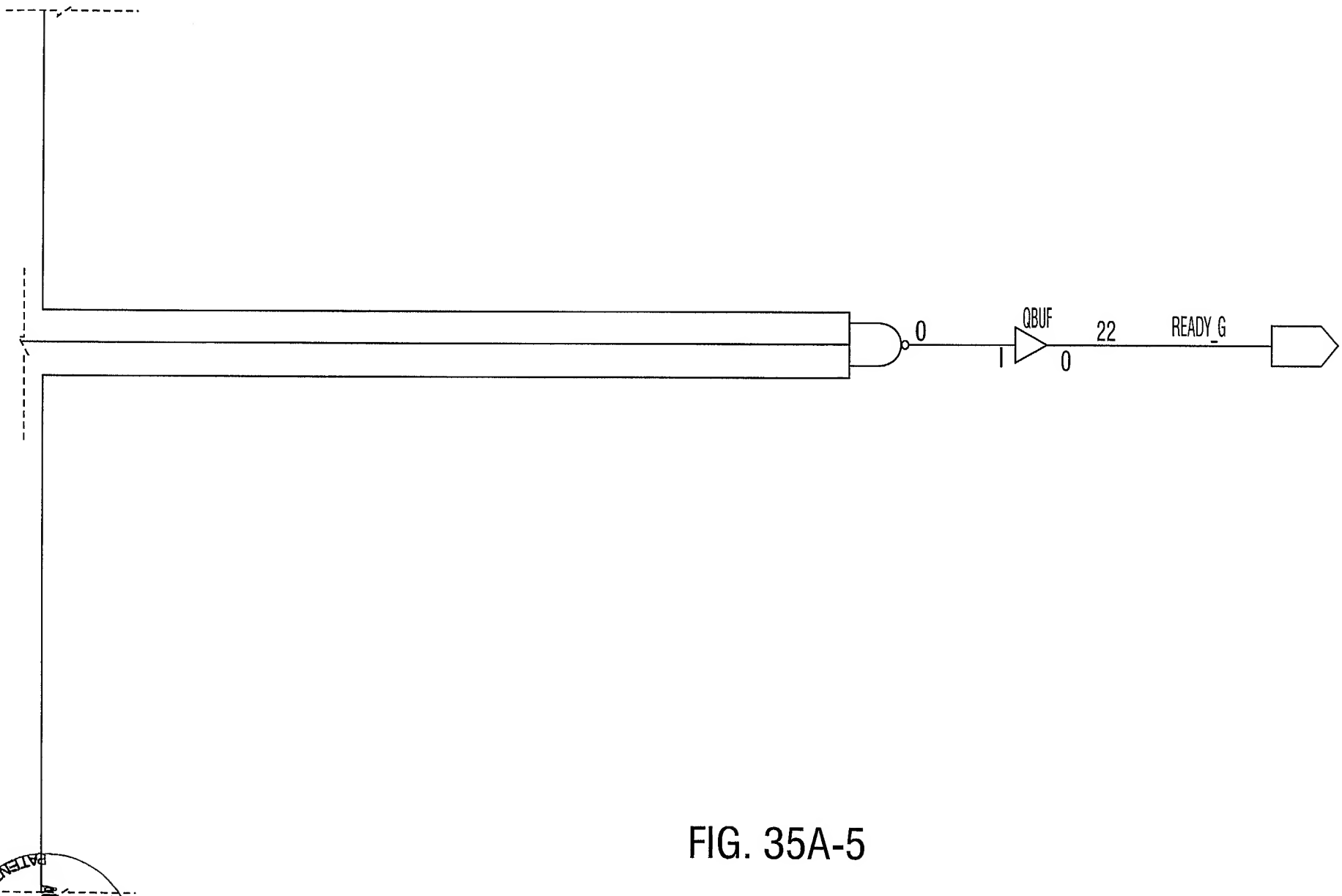


FIG. 35A-5

PATENT & TRADEMARK OFFICE 60 JC109
AUG 0 1 2002
OIPE

20T080"E232000T

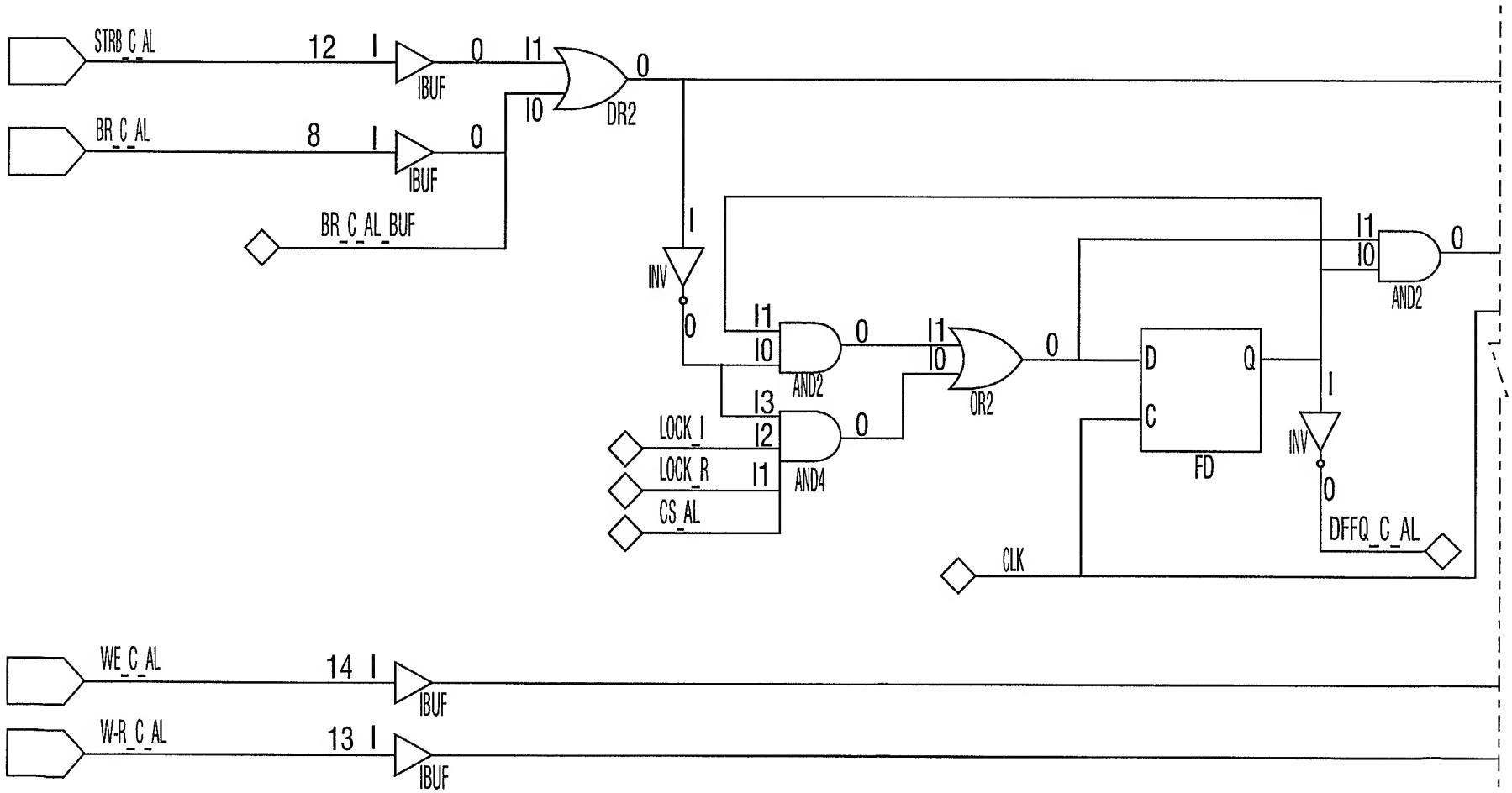


FIG. 35A-6

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AUG 01 2002
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JC109

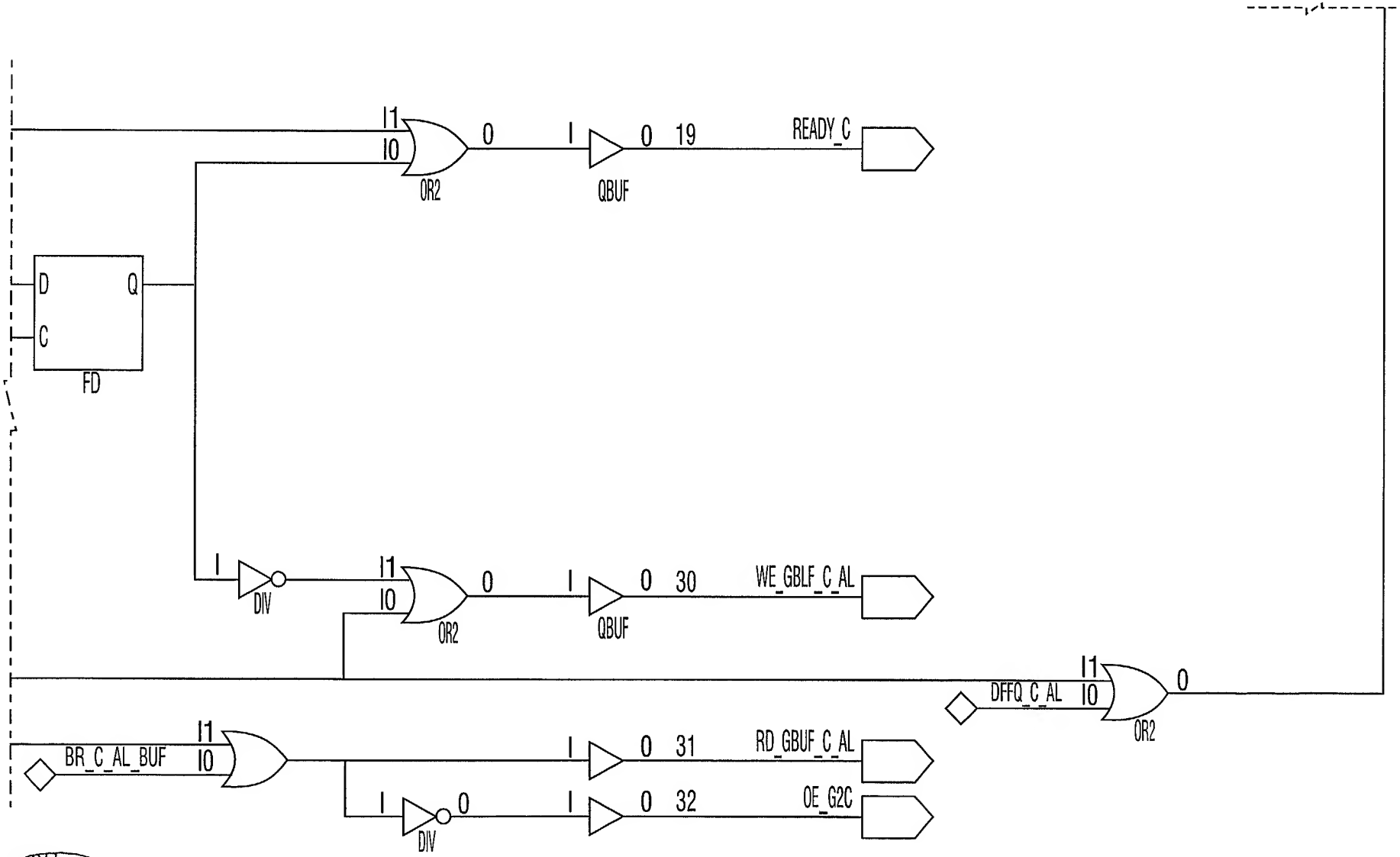


FIG. 35A-7

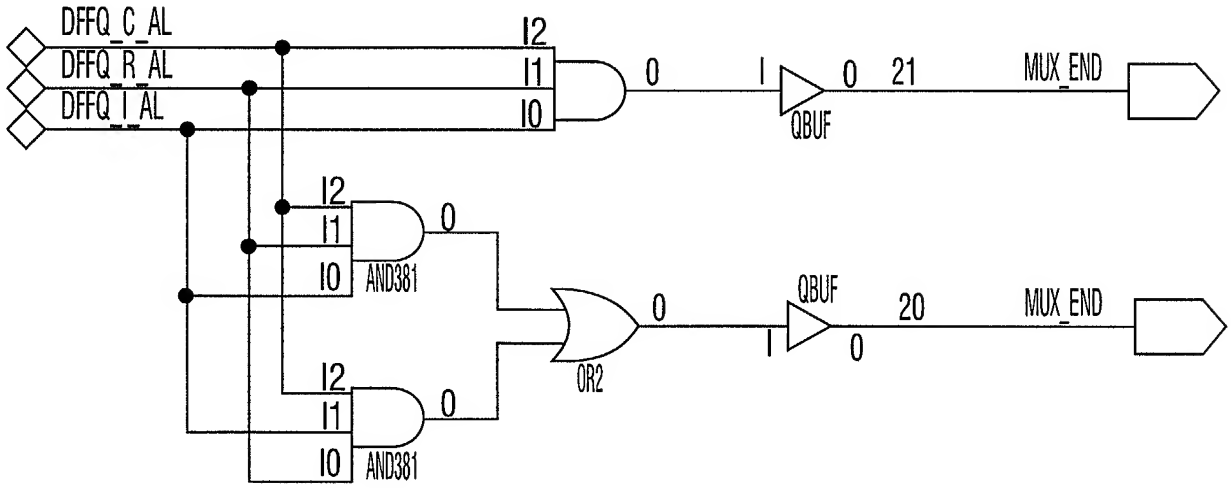


FIG. 35B

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20020801.E2240801

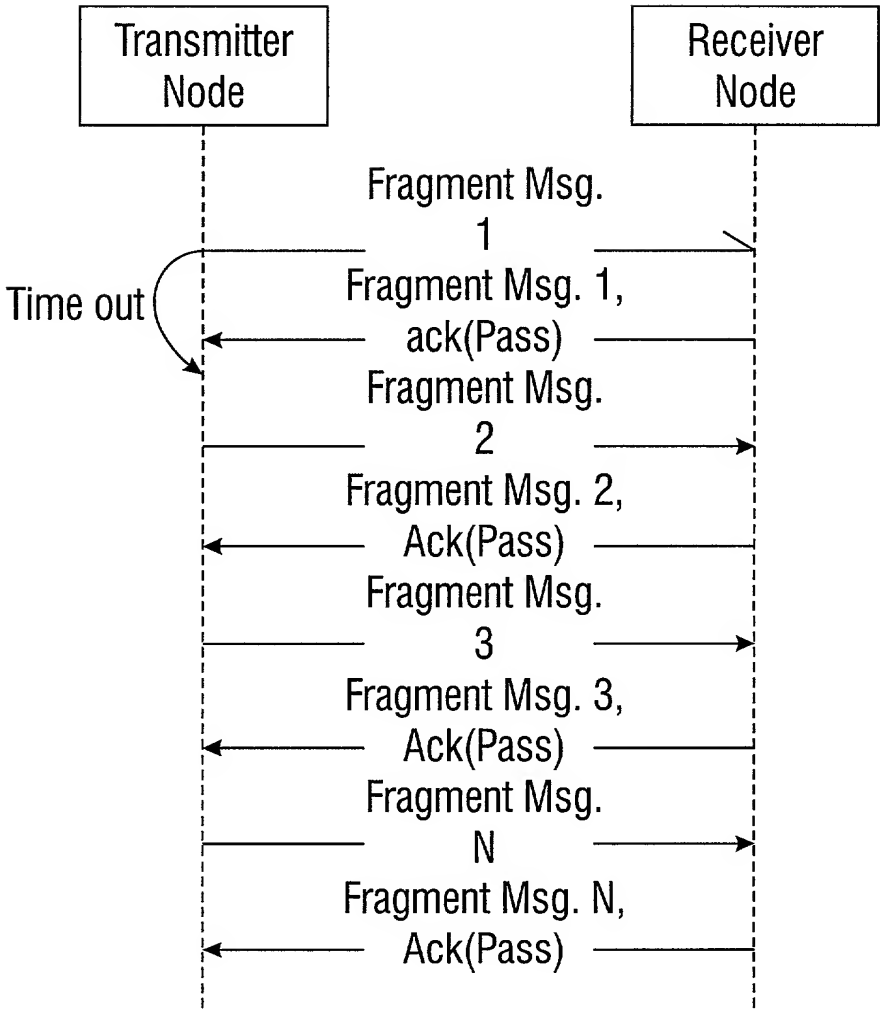


FIG. 36

OIPE
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SCANNED: 8/2/2002

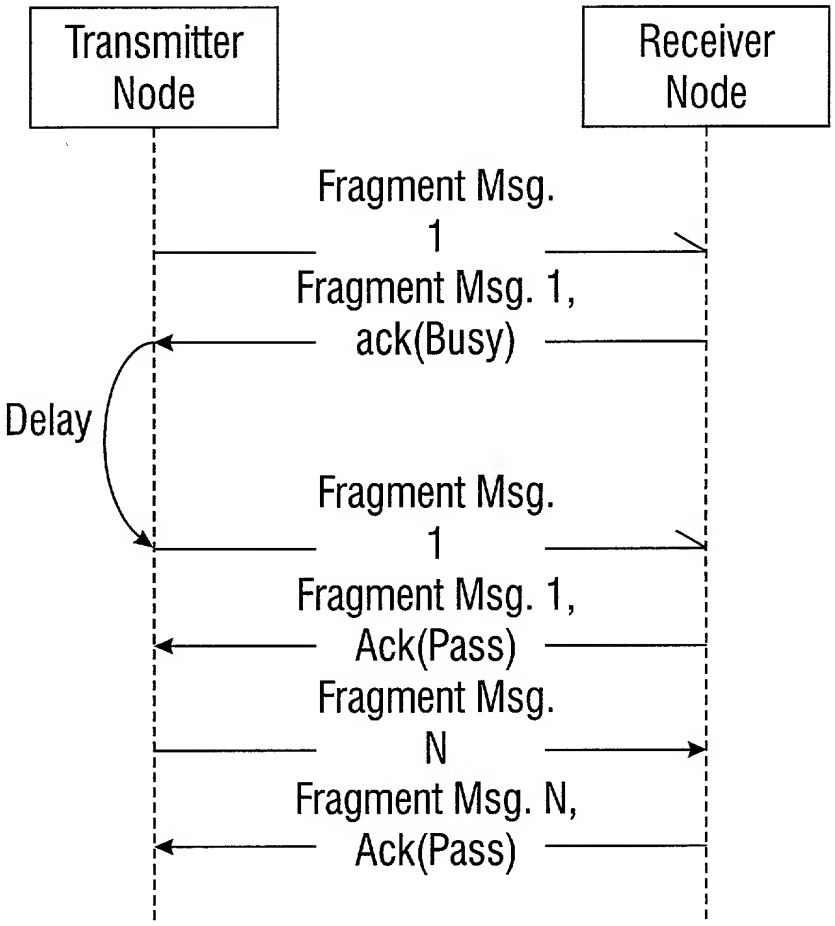


FIG. 37

OIPE JC100 AUG 0 1 2002 PATENT & TRADEMARK OFFICE

PATENT APPLICATION

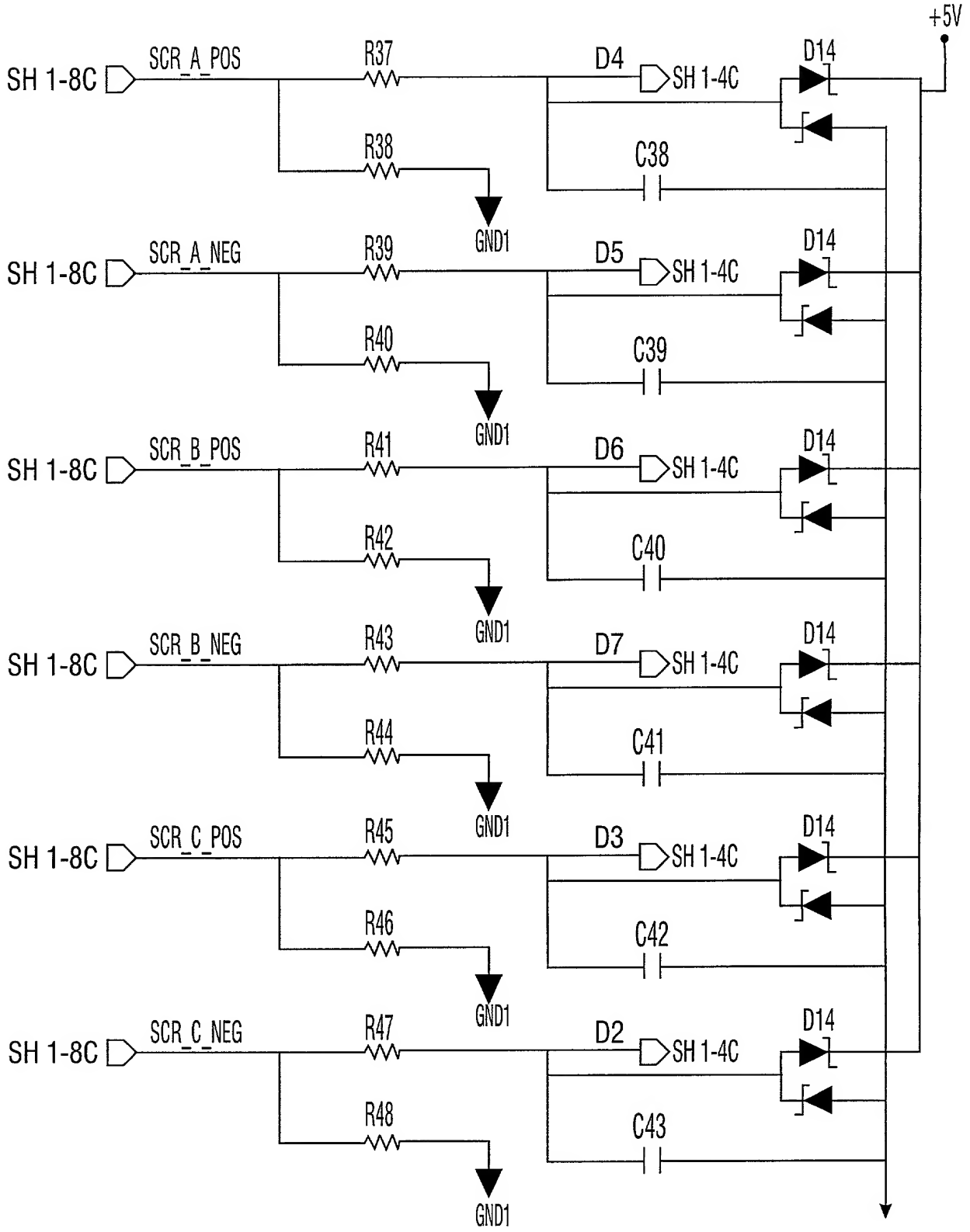


FIG. 38A

OIPE
AUG 0 1 2002
PATENT & TRADEMARK OFFICE
JC10

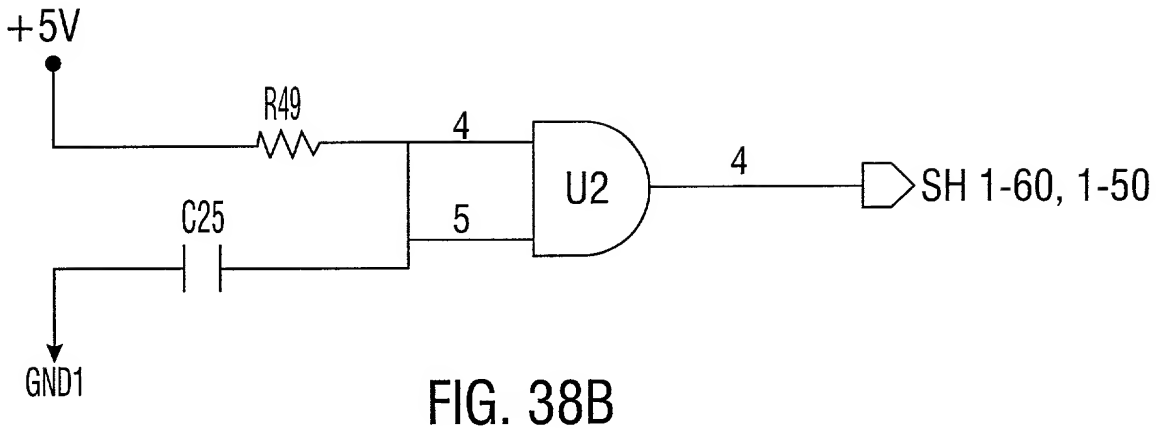


FIG. 38B

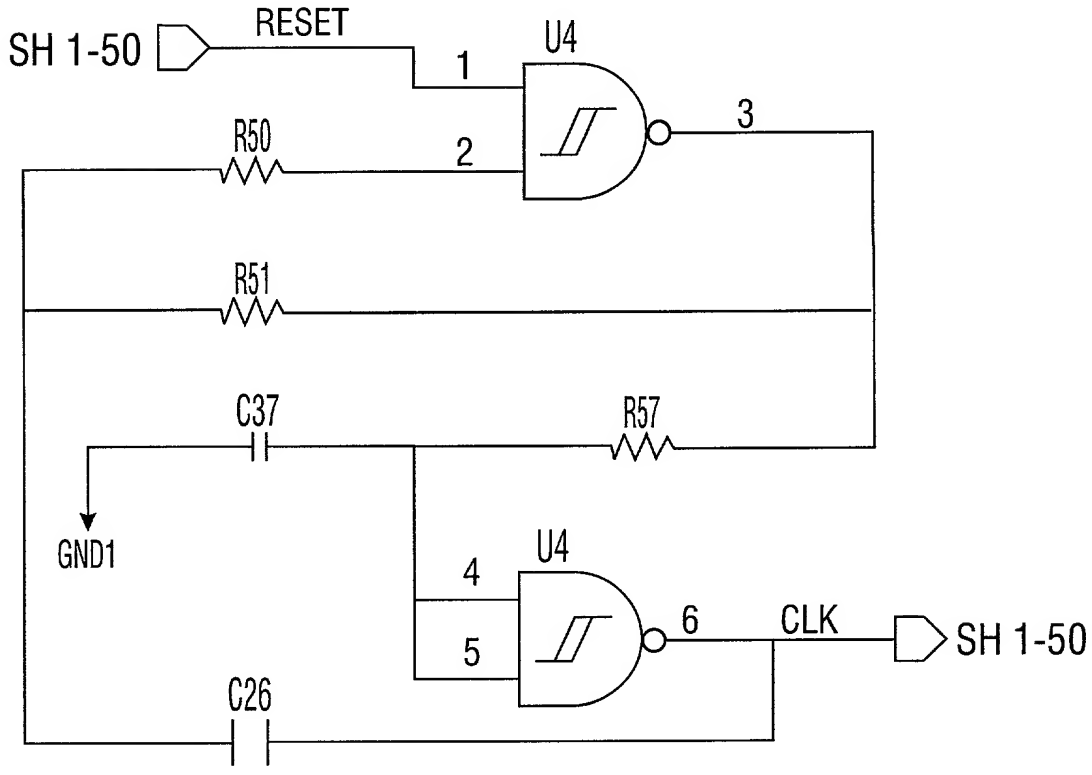


FIG. 38C

OIPE
AUG 0 1 2002
PATENT & TRADEMARK OFFICE
JC:109

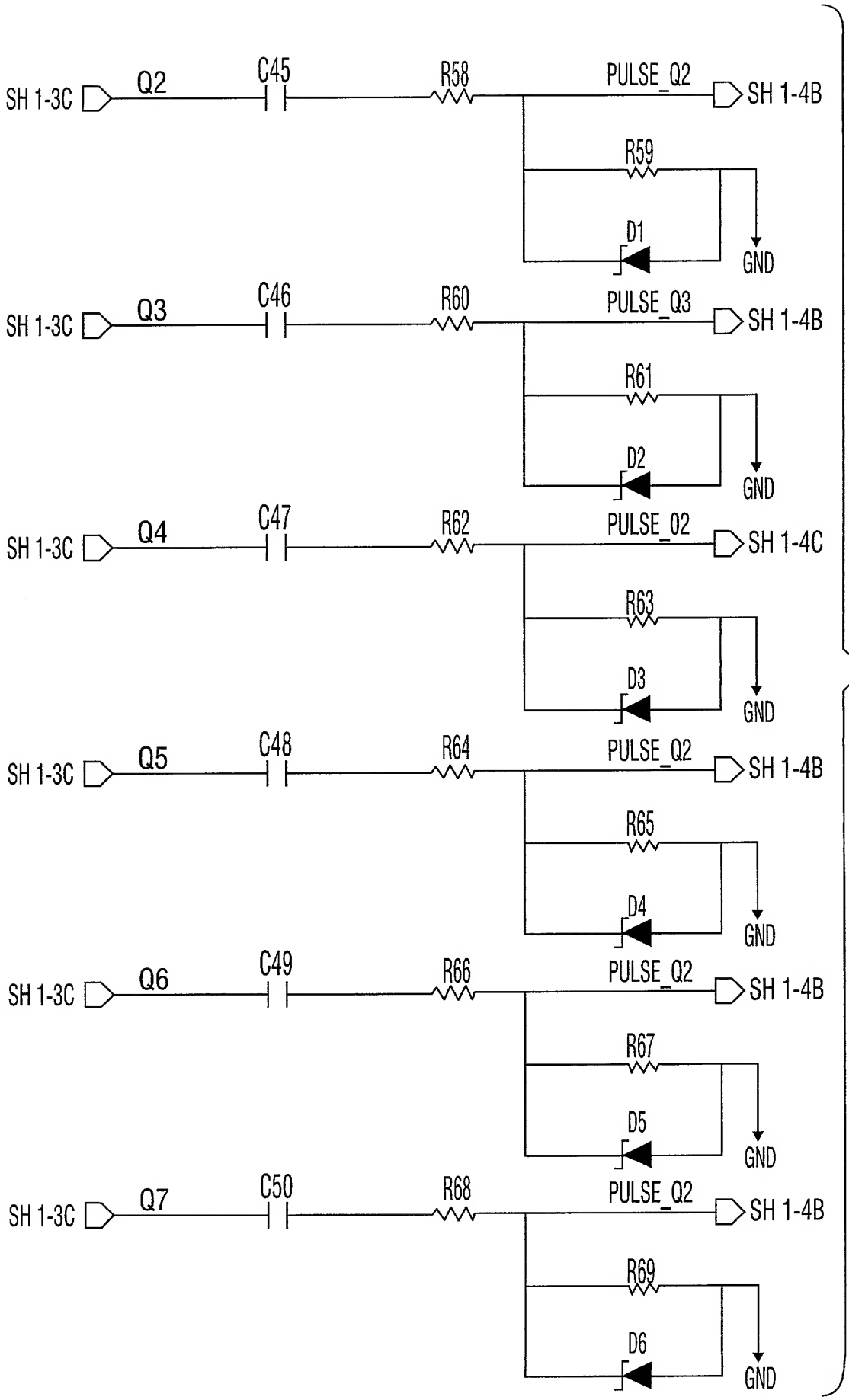


FIG. 38D

20130801-E/S/A0003T

OIPE JC109
AUG 0 1 2002
PATENT & TRADEMARK OFFICE

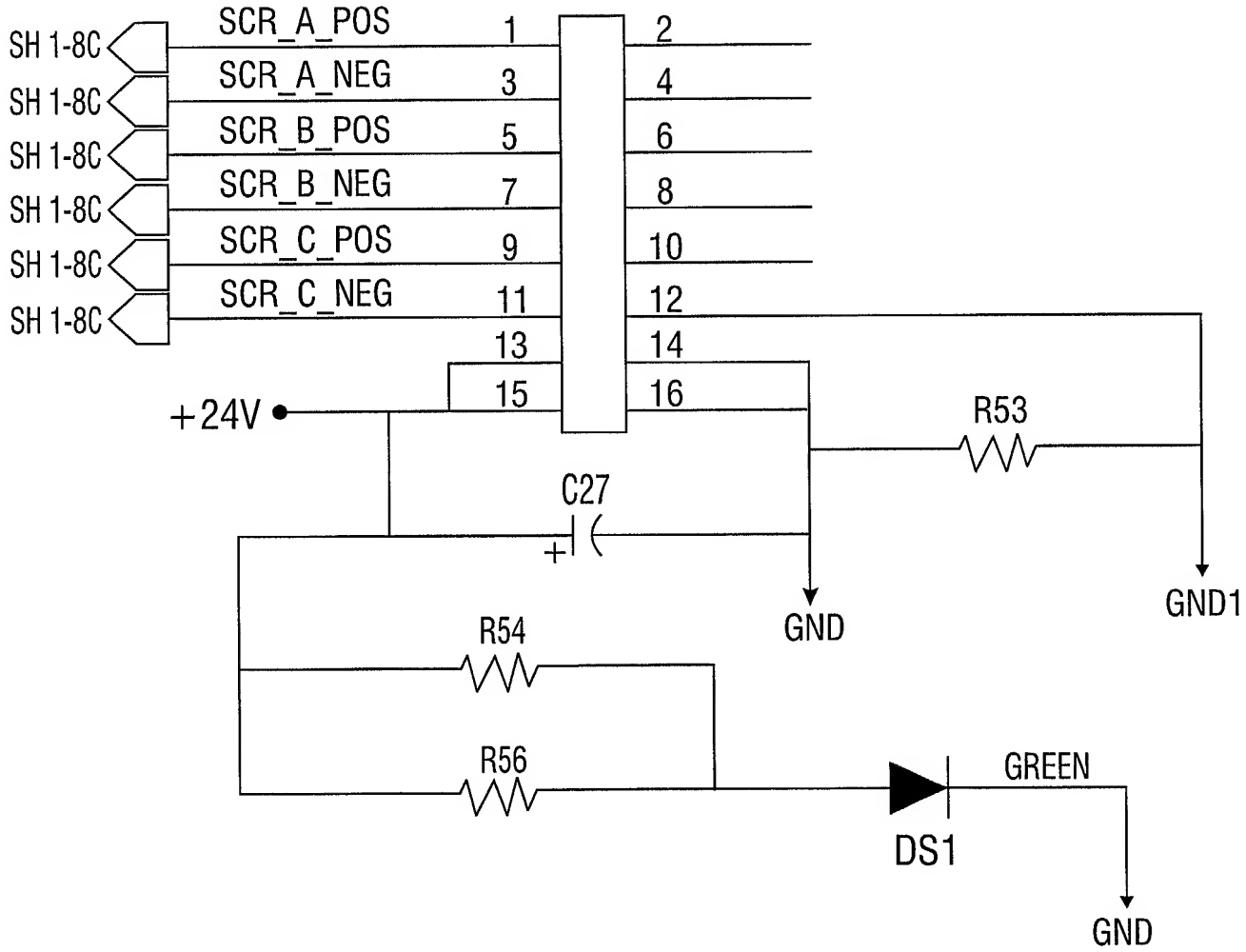


FIG. 38E

PATENT & TRADEMARK OFFICE OIPE AUG 01 2002 JC109

20T060 "E232000T

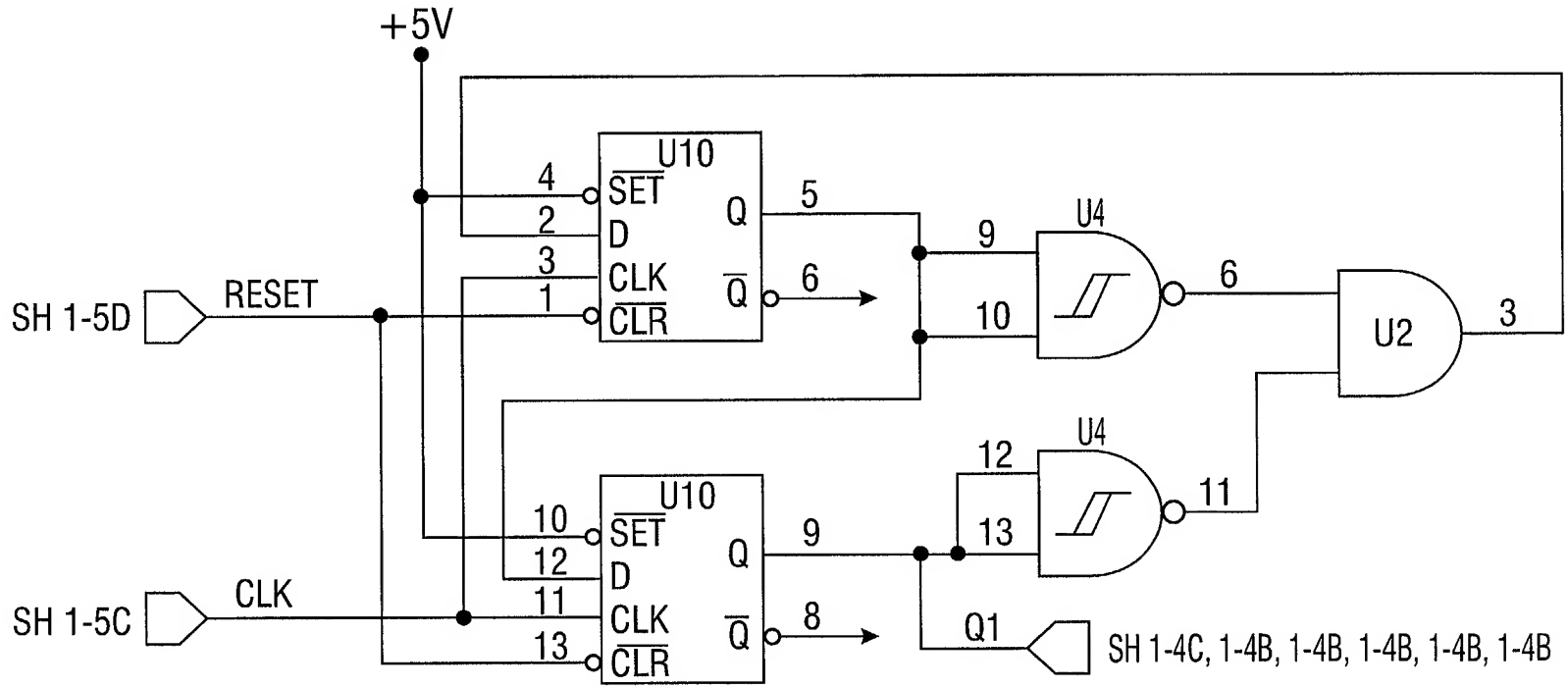


FIG. 38F

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AUG 0 1 2002
OIPE

20T080 "E282001

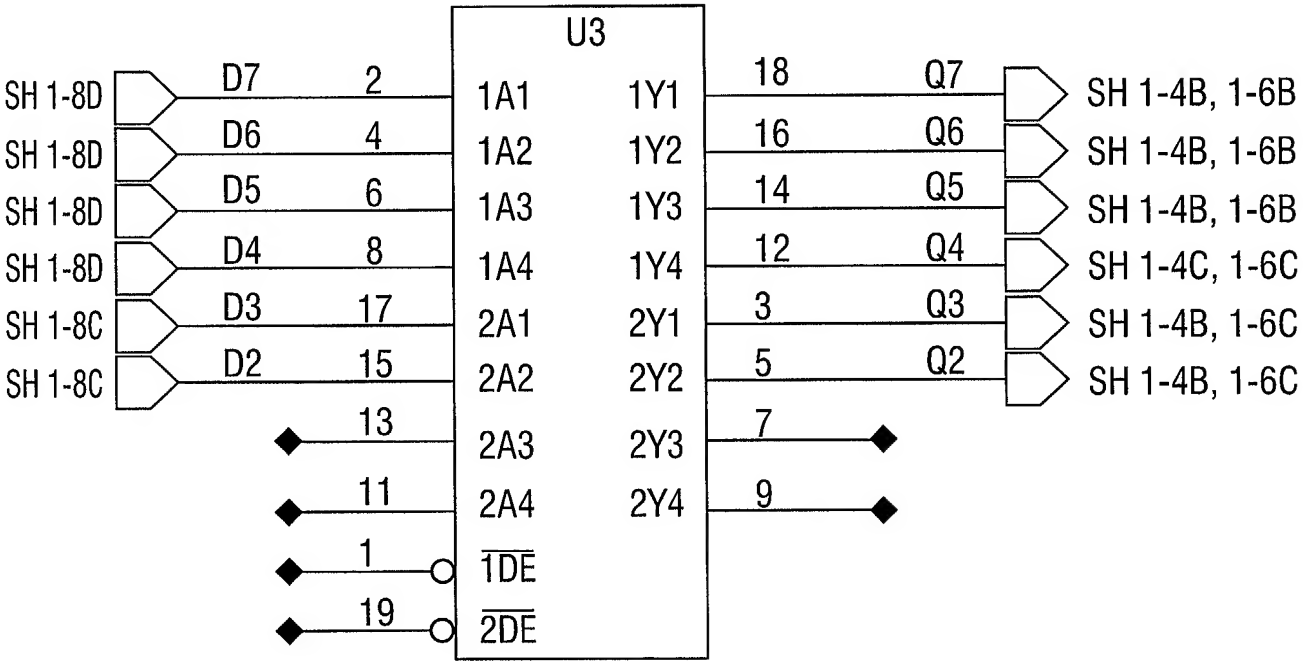


FIG. 38G

PATENT & TRADEMARK OFFICE
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OIPE

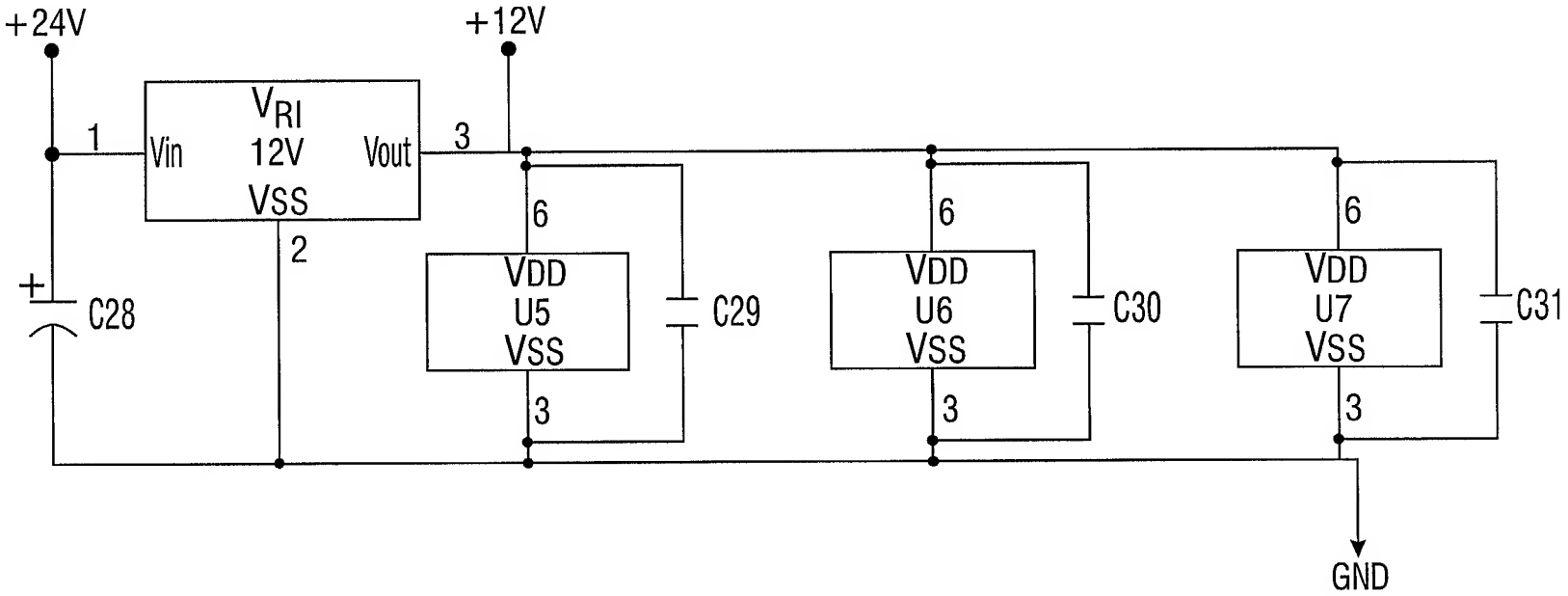


FIG. 38H

PATENT & TRADEMARK OFFICE
OIPE
AUG 0 1 2002

20T080"22200T

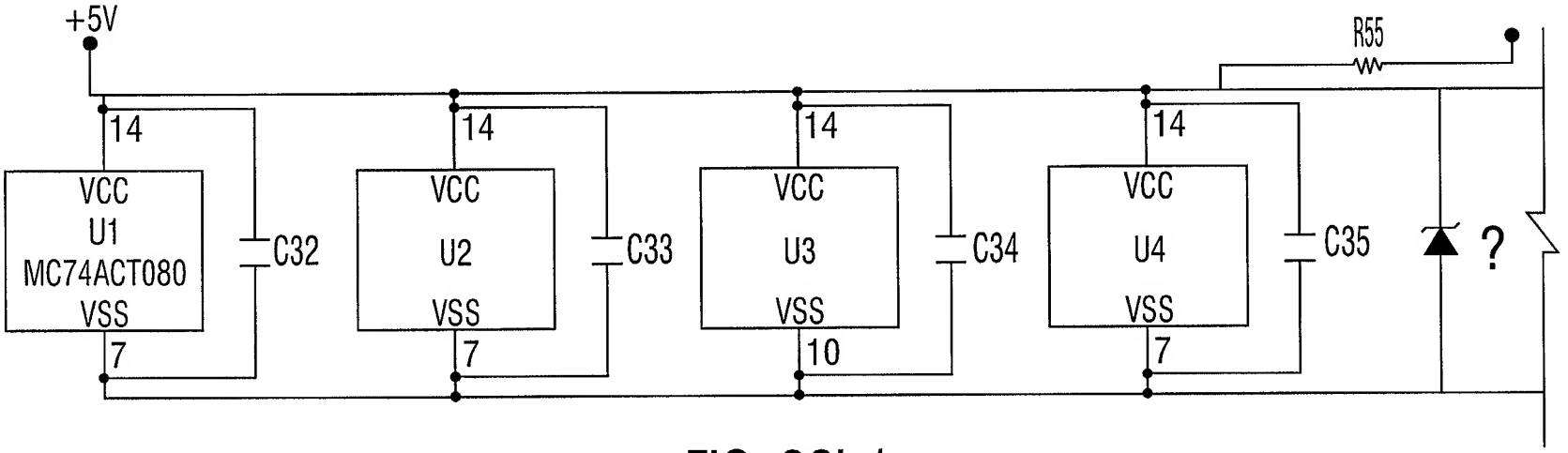


FIG. 38I-1

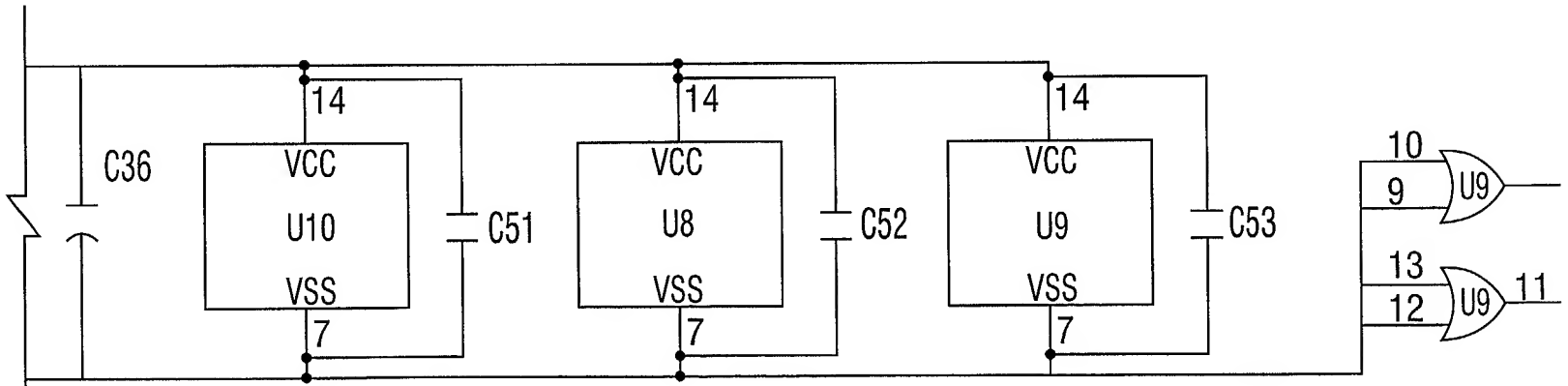


FIG. 38I-2

PATENT & TRADEMARK OFFICE OIPE AUG 01 2002 JC109

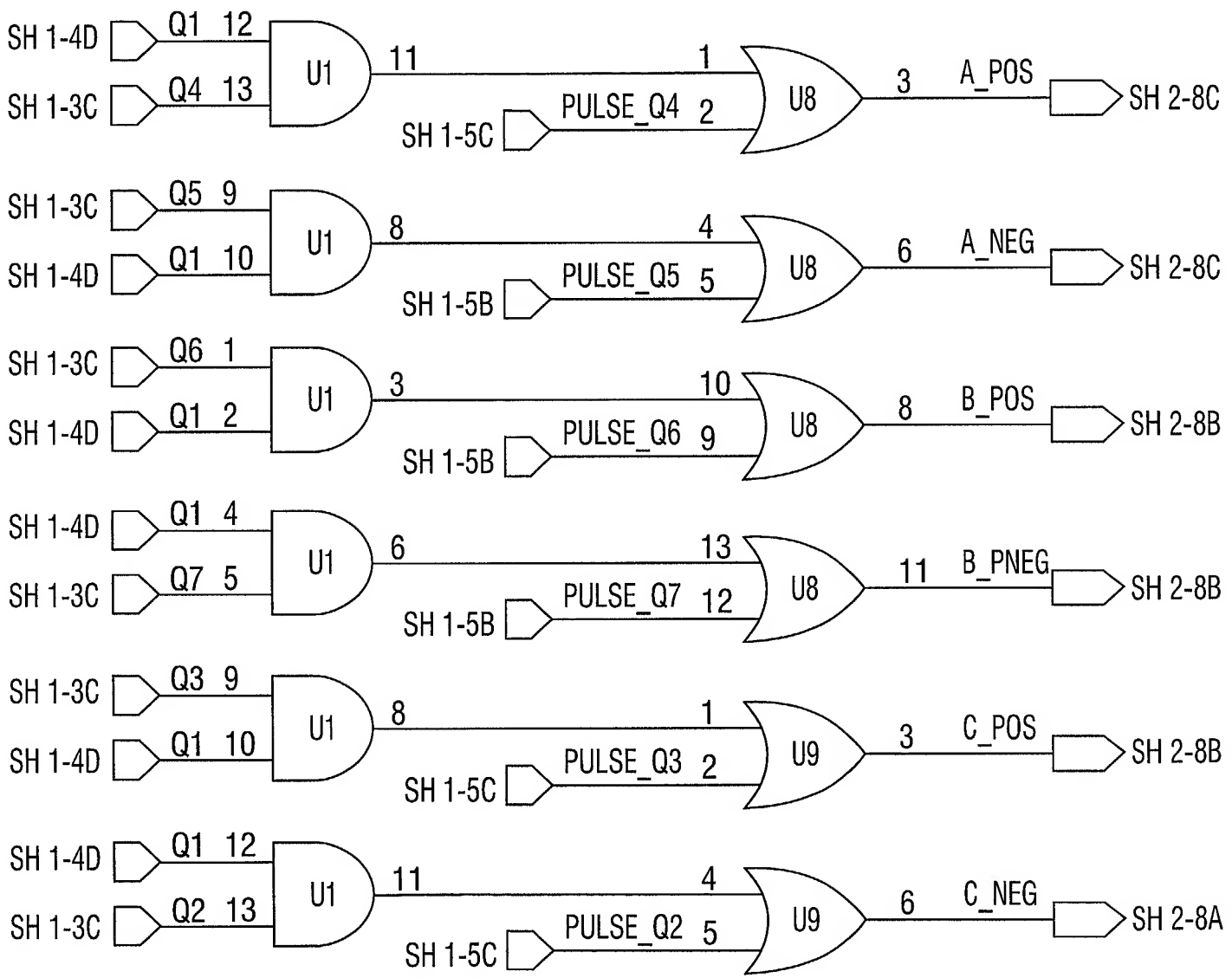


FIG. 38J

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AUG 0 1 2002